CONSERVATION

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FRANK GLOVER HEATON, *Editor*

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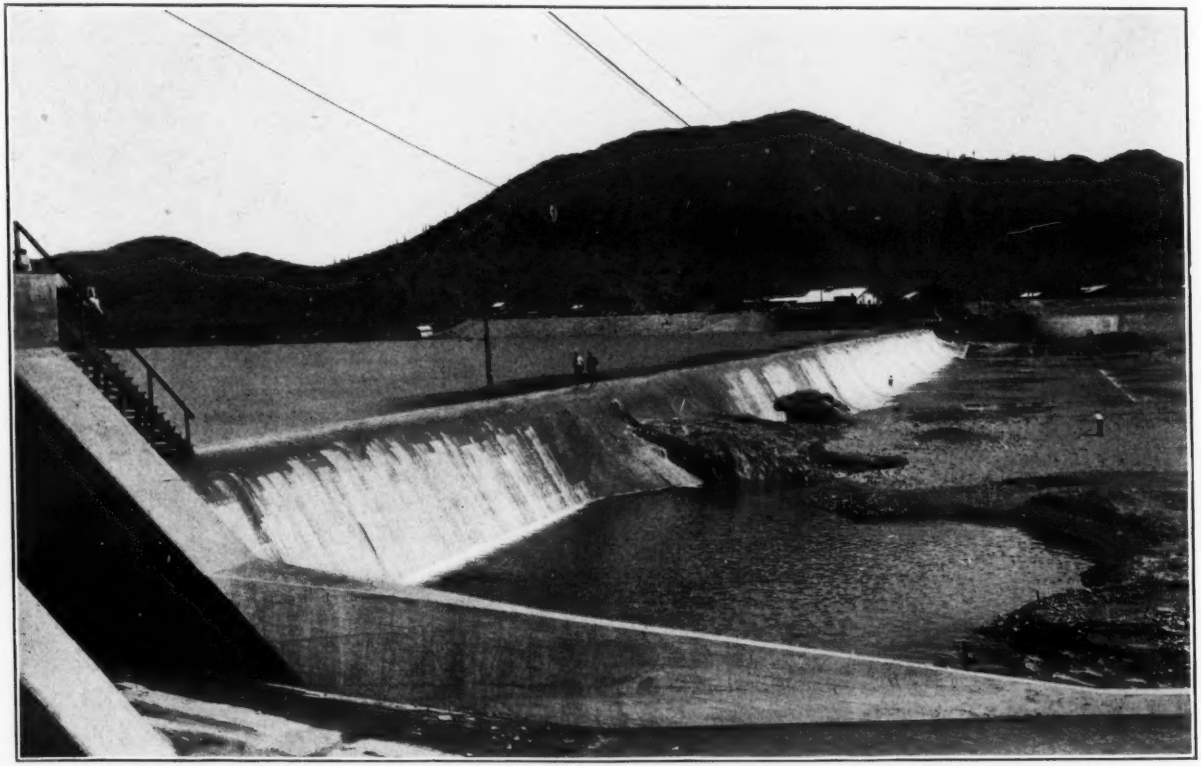


A WESTERN IRRIGATION PROJECT

Dam, Power Plant, and Intake of Main Irrigation Canal. Projects Such as This Are Annually Reclaiming Thousands of Acres in the Arid West and Causing the Desert to Blossom Like a Rose

Vol. XIV NOVEMBER, 1908 No. 11

THE FRAUDULENT HOMESTEADER

By ALFORD L. THAYER

PLAY on the heart-strings of a man until you strike the lost chord of his better self; that part of him grown indifferent and callous in the struggle of money making, and he may confess the weakness of his wrongs upon which you attack him. He may tell you the secrets of years, buried within him, and perhaps through tears, may walk entirely out of his old mercenary career into a decent, honorable life.

In making investigations of the fraudulent homestead and timber claims within the boundaries of the National Forests in the West, I have in almost every district, discovered two distinct types—the person who deliberately sets about to defraud the Government out of 160 acres of land, and the party who has been the victim of a professional locator, working in the interests of some large corporation. The Government has no room on its public lands for a timber thief; Uncle Sam has a great heart that forgives the man who has been betrayed by cunning plans of those higher up who are playing the "big timber game."

I recently called on a shingle weaver, living with his wife and five children in a small house just outside of Everett. I asked him whether he was the same party who was attempting to hold a homestead claim in the Cascade mountains, forty miles from that city. He said he was, and was very much astonished when I explained to him the regulations. Of course he had not complied with the requirements of the homestead law, and offered the usual excuse.

"Why, hundreds of people in this country have taken up claims back in these mountains, and have never been on the land."

"But," I argued, "because thousands of acres of valuable timber have been illegally acquired in the past, is it a reason for continuing such a plundering system in the future?"

"No, but I can't see why you pick me out. My boss at the mill and his lawyer said I could work there, and hold this claim down. They ought to know, for they have had experience before in these cases."

"Have you read the homestead law?" I inquired, storing in my memory what

he had just said, but ignoring the statement.

"No, I should say not. What do we have attorneys for? My boss sent me out with the company cruiser to see the land, go over it, stay out there for a couple of nights, and then the lawyer

FRAUDULENT HOMESTEAD
This 160-acre Claim in Washington Has Six Million Feet of Red Fir and Cedar on It

fixed up the papers and told me what to say when I went to the land office. I tell you right now, I ain't going to give it up, for the boss has been to big expense, and if I back down, he may fire me."

Poor wretch, led by the nose, harnessed into the cart of subjection, and blindly violating the law, depending entirely upon his "boss" and lawyer to protect him in case of trouble. And yet, hundreds of people have successfully made entries on public lands and secured patents under just such pretexts of complying with the law.

After a long and strenuous argument the man was finally compelled to see his serious position with the Government, and relinquished his rights and title to the land, with the understanding that I would make an effort to prevent his "boss" from discharging him.

I called next morning on this timber "king" in his beautiful private office, looked him square in the eye, and said quietly:

"Your man Brown has relinquished his homestead claim located by your timber cruiser because he has failed to comply with the law. He is afraid you will become angry with him, and discharge him from your employ. Please do not let this happen. You are not in position to take any such action against him. Do you understand?"

He glared for a moment into my face as if he would gladly mutilate my features, then slowly paled, and sat forward in his heavy leather chair. His voice was low and strained.

"I understand. Brown shall keep his place. I hope this is the end of the matter."

I bowed myself out without saying much, for I knew this man would sooner or later have to face a federal grand jury, and I did not wish to commit myself. To-day this same man is spending his time in a United States prison, thinking over some of the errors of his ways. Such has been the end of a busy, prosperous but unscrupulous life.

And now comes the story in brief of one of the most noted and remarkable timber locators and public land robbers in the Northwest. There are but few characters like this man in the history of fraudulent claims in this country.

Cascade Bill, omitting the rest of his name for fear of offending him, is a stoutly built, short, burly fellow with one eye, steel gray, and a wealth of fierce black whiskers. For twenty years he has been a professional timber locator in the Index, Washington country, the heart of the Cascade Mountains,

thirty-seven miles from Everett. Index is a picturesque mountain town, with towering peaks around it, and is the great gate entrance to most of the claims taken in that region. Cascade Bill dropped into that country from California with a pretty good knowledge of the Benson-Hyde system, and some ideas of his own. He located with his wife on a tract of land, built a cabin and several outbuildings, cultivated a patch of potatoes, and proceeded to put his "system" into execution.

And so it came to pass that hundreds of people, mostly hard-working, ignorant Swedes, Danes, and Germans, began to swarm into Index, lured by the inducements thrown out by their friends already snugly settled on million-foot timber homestead tracts of 160 acres. Cascade Bill, with his gang, would meet the new victims at the train upon its arrival at Index, conduct them up the trail, and over the "Settlers' Bridge" (about which I will tell later) constructed across the Skykomish River, a beautiful mountain stream, dashing in a swift, tumbling fashion along the edge of the town, and skirting Cascade Bill's land on the east. After a three-mile walk between magnificent firs and stately cedars, drinking in the crystal air, and listening to the lavish descriptions of the timber and "chances" to make a "stake" out of the homestead "business," the new arrival is quite willing and anxious to part with his ready cash as soon as he is "located."

After a good "feed," for Mrs. Bill is a capital cook, and a sound night's rest, the victim was conducted to his "land," and Cascade Bill showed him what were supposed to be the corner stakes and witness trees. It so happened, however, that the would-be homesteader, knowing little or nothing about such matters, was perhaps shown the corner stakes of some claim already settled on. The wily locator was careful to keep "locaters" far enough apart on the land, so that when the cabins were built they would be at a respectable distance from each other. Then the party would pay over to Cascade Bill $325 as a locating fee, or all the cash he had on hand, and give his note with "certain agreements" on its face for the balance. "It comes high," says the one-eyed man, "but I ain't takin' no chances for nothin'."

A VALUABLE "CLAIM"
160-acre Tract in Washington, with Five Million Feet of Timber, Worth about $25,000

And so for years this state of affairs went merrily on, and hundreds of poor people were filched out of hard-earned money, and located on land, some of which had been "located" as high as ten times before. Cascade Bill actually showed four men the timber on the east forties of his own claim, and ingeniously piloted them around trails, covering the same ground until they had tramped over 160 acres of land, then "located" them on his own land. The innocents took his word for it, and built cabins which to-day stand on the claim originally squatted on by Cascade Bill.

But all good things come to an end in time, and so when I arrived on the scene with two big husky rangers, to make investigations of the land frauds in that section, Cascade Bill was at first panic stricken. He knew it would now only be a question of a short time until his crooked work would be exposed, but like all rascals he had disposed of his money lavishly, on the "come easy, go easy" system, until he had little left but the notes of his victims, an occasional fee for a short time, and generally a comfortable "cargo" of Index whisky. Then he was afraid to leave his homestead claim for any length of time, as he had never offered even a filing (in order to keep his land off the records, so that he might juggle it in the fashion stated above), for fear some person might "jump" his claim. On the other hand the old grizzled mountaineer saw the "handwriting on the wall," and dreaded to think of iron bars and striped suits.

So Cascade Bill fumed and stormed at the bar over his whisky, and threatened that if "that damned inspector did not 'come in,' he would scatter his brain matter about the sidewalks of Index." I paid no atention to the statements issued from this timber "baron," and proceeded to "break" into his ring. Three days of terrifically hard work, and some good results; Cascade Bill suddenly changed his tune, and became diplomatic. With three of his right-hand men he called on me at the hotel, and was very gracious. His smile was a painful effort, and did not add to the beauty of his already distorted features, caused by his blind eye. He held out his clammy hand, and sprawled into a rocker, chewing tobacco like a cow her cud. He beamed on my two rangers, who ignored the honor, and stationed themselves near me, in close proximity to their six-shooters. The fact seemed to get out that Cascade Bill was a "dead shot," and the boys were loath to gather up my gray matter, and ship me in sections back to Washington. Of course I was amused, but concerned, not to say interested, in this character who had collected homestead fees to the amount of something like $25,000 in the twenty years he operated in that country.

Cascade Bill found that his threats had failed to drive us from the work we had been detailed to do, and changed his tactics. He outlined a generous plan by which we could all make a nice "rake off" and still hold our positions. I declined with thanks, and he switched again, and asked me to partake of Sunday dinner with his wife and himself. I accepted in haste, for this would give me an opportunity I wanted greatly, to meet and talk to a woman whom I understood wrote all of her husband's letters, acted in fact as his private secretary, for Cascade Bill could neither read nor write. The rangers were greatly worried over my going alone to this man's cabin up in the woods, but I arranged to have them near by, and instructed them by means of a signal that would not be noticed by the locator or his wife, that I could give in case I needed them. They were to remain in hiding until after the dinner hour, then saunter leisurely in, as if they had accidently happened that way.

I was on hand next day on schedule time, and Mrs. Bill made a great fuss over me. She fumed and sputtered as most fat people do, over the dinner, but finally we sat down to a very excellent repast, with chicken as the principal feature. Everything moved smoothly, and our conversation became quite animated on various subjects, until coffee appeared. I noticed a queer odor about it the moment Mrs. Bill placed the cup beside me. I also noticed the woman was unusually pale, despite her red face. Then I detected a rather greenish scum appearing on the top of the coffee, and decided that I would only make a pretext of drinking it. You see, I was on the lookout for almost anything to happen, and knew that Cascade Bill had some "ax to grind" by that invitation. The old man eyed me cautiously, and noticed I did not drink the coffee.

"Drink up, and I will show you about the place," he insisted.

I thanked both of them graciously, but I said I never drank coffee, and we left the table. I thought the locator looked disappointed. I urged Mrs. Bill and her husband to exhibit their garden and other "improvements," and managed to get them outside without disturbing the debris of the dinner. Then I gave the signal for the boys, and soon they sauntered quietly in. In a moment, while one of the rangers was engaged with Cascade Bill and his wife over a peculiar species of berry that grew in the mountains, I managed to get the other ranger aside, and instructed him to get into the cabin unseen, if possible, and empty the contents of that coffee cup into his canteen.

This feat was dextrously performed, and we soon left the claim, after expressing ourselves pleased with the call, and myself with the dinner. Sufficient to relate, that after an analysis of the coffee by an expert, it was found to contain one-half ounce of rat poison. Thus does man escape the traps set for his downfall. I was very grateful that the manufacturer had inserted an odor into his poison. I often wonder what Cascade Bill said to his wife about it after I left their hospitable roof.

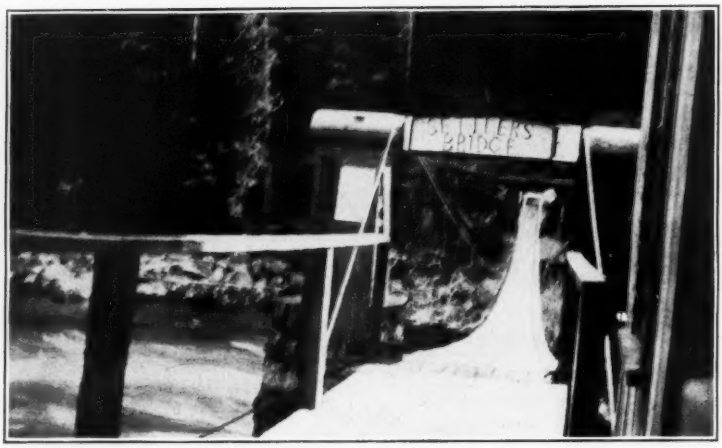
I went on with my work of investigation, and turned up startling and lurid tales about this man and his dark deeds. As fast as the deceived homesteaders gave up their land, they unfolded their troubles to me, and were willing witnesses as to his treachery. Space will not permit me to repeat one-tenth of these stories, but the history in brief of Cascade Bill's creation of the "Settlers' Bridge" should not be overlooked.

None of the claims in question could be reached by a single roadway, as they were located between two steep mountain walls, with no highway entrance to the outside world. The railway crept through a narrow strip of right of way, following the river banks into the town and out of it. Index is perhaps one of the very few towns in the United States having no roadway in or out of it to the country outside.

Therefore, when Cascade Bill first located in this timber fairyland, one of his first acts was to build a suspension

ANOTHER RICH "CLAIM"
This 160 Acres Contains Nearly Ten Million Feet of Valuable Timber

foot bridge across the river. It was constructed of wire cables and short planking, closely set, with timber archways at either end. The bridge is said to have cost originally $500. From each new settler crossing that bridge to fame and fortune, the old locator collected $10, as his or her share of building that structure. It is carefully estimated that Cascade Bill located in the neighborhood of 1,200 persons in the twenty years he carried on his system in that country. Thus he realized the fabulous profit of $11,000 on his original investment.



THE SETTLERS' BRIDGE

A Profit of Nearly $20,000 Was Made on This Bridge, which Cost, Originally, about $500

And this is not all. Most of these homesteaders located in the vicinity left their claims during the severe winters, and sought residence in the surrounding towns. But Cascade Bill remained on his claim all winter, for there was money in it. About once a month, he dictated a letter to nearly every settler, informing him or her, that a storm had damaged the bridge to such an extent that it would have to be repaired immediately.

He explained that each man or woman's share of the expense would be about $5. It is said that, in the fifteen years he practiced this scheme, he collected about $8,000 for repairs to a bridge, which people in Index told me never was damaged but twice in that time, and then was repaired in a half day at a cost of about $50.

But Cascade Bill soon met his Waterloo, as murder came out. He came home fearfully intoxicated one night in December, kicked his faithful spouse out of doors, locked her in the woodshed, and threw in after her the bones his dog had not touched that night. The next morning he temporarily disappeared, and one of our rangers found the woman in a half-dead condition from cold and hunger, two days later, attracted by her pitiful cries for help, as he passed near the claim to a ranger station close by.

We took the woman in charge, and after she had fully recovered, she told us one of the most heart-rending stories of abuse that I have ever listened to. A complete separation and divorce followed, and on the condition that she would testify against her husband in land matters, I agreed not to push the poison case against her.

The shadow of prison walls hover grimly over the wasted form of Cascade Bill to-day, and his dreams can only be of the ill-gotten gold he took from the ignorant poor who trusted and listened to him. The guards say that he turns restlessly in his sleep, and mutters something about "fine location," and a "fee of $325." In a distant northern city his wife, old and gray, is toiling out her few remaining years over a sewing machine, and shedding a tear now and then for the man who came to her many years ago in the excellence of his young and promising manhood, and asked her to be his wife. She can only live over in her memory again a few happy years before he began his downward course, and who envies this isolated woman the little comfort she may gain from a few stray golden thoughts of the buried past?

THE BLIGHT ON CHESTNUT TREES

By JOHN MICKLEBOROUGH, Ph.D., Brooklyn, N. Y.

IN THE summer of 1905, the native chestnut trees in the New York Zoological Park gave evidence of the presence of a very destructive disease. It was soon discovered to be the work of a deadly fungus. Dr. William A. Murrill of the New York Botanical Garden, made a careful study from living trees, twigs and pure cultures and published his observations in June, 1906, and in September of that year gave a scientific description, placing the fungus under the genus Diaporthe and from its characteristic habit this new species was appropriately named *parasitica.*

Botanical relations.—The fungi are spore-bearing plants and are regarded as higher than the fresh water and marine algæ or seaweeds, and lower in organization than the mosses or ferns. The fungi include such plants as moulds, mildews, rusts (on plants), mushrooms, and yeasts. The class of the fungi with which we are now concerned are known as the sac fungi or Ascomycetes. Probably 50,000 species of fungi are known to science, and of this number more than 15,000 species belong to the sac fungi. The order of the Ascomycetes to which parasitica belongs is termed Prenomycetes. More than 110 species of Diaporthe have been described. Most of these species are saprophytes—that is, they subsist on dead or decaying tissues. One species, at least, is a parasite, and its only host seems to be our native chestnut trees.

Method of growth.—The spore, carried by the wind, on the feathers of a bird, or in the fur of a squirrel, finds a lodgment where the bark is abraded and immediately develops the threads or filaments, technically called mycelium threads, which constitute the vegetative body of the fungus. The destruction begins by a spore gaining access through an opening in the bark to the cambium or thin-walled cells which make new wood on one side and new bark on the other. As the spore develops beneath the bark, there are innumerable thread-cells which grow up and down and especially around the branch or trunk. The tree, or twig, or branch, is now at the mercy of the parasite. In one or two seasons at most the girdle is complete, and all nutriment is effectively cut off from all parts beyond the place of the infection. The girdling is as complete as if one had taken an ax or a saw. During July and August of 1907, and also during the summer of 1908, many branches of chestnut trees showed signs of decay and the green leaves of spring withered long before the frosts of autumn had touched the foliage. By degrees the young bark changed its color from an olive-green to a dull reddish-brown. On the older trees the discoloration of the bark is not apparent, but in the deep fissures evidences of the presence of fungus may be seen. By skilful tapping with a hammer, any one may distinguish the dead from the living bark on the oldest trunks. Where the fungus has been at work, the sound is a tone lower and somewhat muffled and has not the characteristic sound coming from the healthy bark. There is a dead layer between the bark and the wood of the trunk.

But there is another stage of growth to be considered. It is the fruiting body, solely for the purpose of producing spores and perpetuating the species. As the fungus grows, it also matures by sending out through the pores of the bark small oval pustules. These are the fruiting bodies or spore-producing bodies of this parasite. Each

WORK OF THE CHESTNUT FUNGUS

Trees Killed by the Disease which Is Rapidly Destroying the Chestnut Timber of the East

pustule, the size of a small pea, yellowish in color, may enclose several tiny flasks with long necks opening on the outer surface. These flasks are lined with a number of sacs, each containing eight spores. It would take about 500 of these tiny sacs to measure one inch, if placed end to end. About 3,000 of these spores, end to end, would measure one inch. These sacs filled with spores are the resting stage and carry the parasite over the winter months. Early in spring innumerable spores, of another kind and size, are produced in long thread-like masses directly from the mycelium threads. A partition is thrown across the end of a thread and it becomes a spore. Thus spore after spore is produced from the same thread by a process called "abstriction." The sac spores are fertilized spores and the second kind of spores are the asexual ones. There are two distinct kinds of spores, different in origin, but the same in power, each kind capable of producing a new plant. Spores are produced by countless millions.

Geographical distribution.—In October, 1907, woodchoppers were set at work to cut down all the chestnut trees in Prospect Park in the city of Brooklyn, N. Y. The park has an area of 516 acres, of which about 110 acres are natural woodland. During last winter over 1,400 trees were felled and cut into cord wood. Brooklyn has another park on its eastern border of 536 acres, most of which is natural woodland, and there are in it from 3,000 to 5,000 chestnut trees—many are dead and probably not one can be saved.

The writer delivered an address to the students in the State Normal School at Trenton, N. J., on Arbor Day, May 1, 1908, and an examination of chestnut trees in the vicinity of Trenton gave ample proof of the ravages of the Diaporthe parasitica. On Staten Island, on property adjacent to Sailors' Snug Harbor, the disease exists in malignant form. From personal inspection of the forests in the northern part of Somerset County, New Jersey, and also Morris County, very many of the chestnut trees were badly infected. In the localities examined in these two counties, the chestnut growth was very abun-

THE BLIGHT ON CHESTNUT TREES

This Blight Has so Far Confined Itself to the East, where It Threatens Soon to Destroy All the Chestnut Timber Standing. Picture Taken in Forest Park, Brooklyn, N. Y., in June, 1908

dant, the chestnut trees being two to one over any other kind of tree.

The microscope revealed the spores taken from chestnut trees as far north in the Hudson Valley as Newburg, Beyond this point the limit has not been ascertained. During the past summer a careful examination was made on each side of the Kaaterskill Cove in the Catskill Mountains and the chestnut trees were found to be not infected. The trees in the Hudson Valley at Palenville were found to be in a healthy condition. A visit to Hudson City and Athens gave opportunity to examine the growth on each side of the river, but evidently the disease has not yet penetrated so far inland. From reports the infection has appeared in the neighborhood of Philadelphia and in western Connecticut.

Extent of damage.—A conservative estimate would place the extent of damage at not less than $10,000,000. It is difficult to estimate the value of a tree. The writer examined a beautiful chestnut tree, just north of Catskill City. The trunk two feet above the ground measured fourteen feet six inches in circumference, and the line from the tips of the branches directly opposite was over 100 feet. The owner would not take $50 for that one tree.

Remedy.—Various suggestions have been made to save infected trees. Spraying with fungicide mixtures, such as bordeaux has not produced satisfactory results. The growing mycelium threads of the parasite are beneath the bark. It is purely a hypophloeus growth and thus escapes the effects of the spray. Some of the thread-like masses of summer (conidial) spores would be washed away, but other bundles of spores will exude from the same pustules. Experiments with arsenical compounds commonly known as insecticides have not been efficaceous. Neither Paris green nor London purple is of any appreciable value.

The cutting away of infected parts and coating the wound with tar is not productive of good results. It would require a most careful microscopic examination to determine how far back to cut, for the reason that the thread cells of the fungus have penetrated beyond the discoloration of the bark. The cutting remedy is not only expensive, but impracticable from the difficulty of determining all points of infection from the trunk to the outermost tips of all the branches. And when the surgical operation has been complete what kind of symmetrical tree is left? Suggestions of injecting a fluid beneath the bark, and into the roots of the tree have been made and reports of such trials are at hand, but in no case has an experiment been successful in staying the ravages without at the same time injuring the tree. A remedy that is as injurious as the work of the parasite is not worthy of consideration. The ground about the tree has been saturated with liquids containing various ingredients, and again nothing worth reporting has resulted from the effort.

Insect pests may be held in check in various ways. Birds devour the eggs and the larvæ. While the larvæ are feeding upon the leaves or boring through the wood poisonous sprays and fumigation may be resorted to for their extermination.

Although a remedy is not at hand, yet man has overcome greater problems. Certainly the problem is now demanding prompt attention since the entire chestnut growth of this country is seriously threatened. There is great consolation in the fact that, so far, all other forest trees have been immune.

THE NATIONAL IRRIGATION CONGRESS

Sixteenth Session, Albuquerque, N. Mex.

NEARLY 900 delegates attended the Sixteenth National Irrigation Congress, the first session of which met at Albuquerque, N. Mex., on September 29. The Congress was one of the most interesting and successful that has ever been held, and the interest, both from a scientific and a popular standpoint, was well sustained throughout the entire meeting.

Messrs. A. P. Davis and C. J. Blanchard represented the Reclamation Service at the Congress; Dr. W J McGee, Secretary of the Inland Waterways Commission, read an extremely interesting paper, while others on the program were: Governor Curry, of New Mexico; former Governor L. Bradford Prince, of New Mexico; Mr. John Barrett, Director of the Pan-American Bureau; Mr. Geo. C. Anderson, the well-known Colorado engineer; Mr. A. L. Fellows, of Colorado; Mr. C. M. Mott, of Minnesota; Judge D. C. Beaman, of Denver, who is prominently identified with large corporation interest in Colorado.

The fight for the next Congress was a spirited struggle between Spokane, Wash., and Pueblo, Colo., the former city finally winning out. Officers elected for the Seventeeth National Irrigation Congress are:

President, Geo. E. Barstow, Texas; First Vice-president, Col. D. H. Loveland, California; Second Vice-president, R. E. Twitchell, New Mexico; Third Vice-president, I. D. O'Donnell, Montana; Secretary, B. A. Fowler, Pheonix, Ariz.

The members of the permanent Board of Control are: Geo. E. Barstow, Fred J. Kiesel, W J McGee, B. A. Fowler, with one vacancy remaining to be filled.

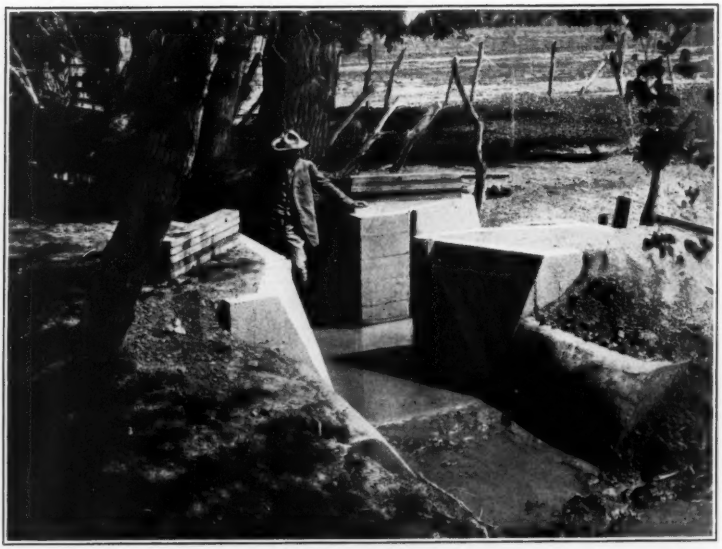
The resolutions follow:

REPORT OF RESOLUTIONS COMMITTEE

The Sixteenth National Irrigation Congress takes note with great satisfaction of the recent progress in irrigation and in other uses of waters, and records its high appreciation of the fact that greater progress has been made in this direction during the years since the congress has been an active factor in public affairs than during all the earlier years of our country's history. Great as this progress has been, there is need for continued action on the part of this organization and of the citizens who have combined to render the successive congresses successful. In some measure, indeed, it seems clear that the organization has barely passed the threshold of its career of usefulness to the people of our great West.

The leading sentiments growing out of this congress are expressed in the following resolutions:

Resolved, That we signify appreciation and approval of the work of the Federal Government largely in accordance with the recommendations of past congresses; that we particularly commend and indorse the work of the Reclamation Service in extending the usefulness of the waters of the arid region, thereby increasing our population and production, and multiplying homes on the land, together with the work of the Forest Service, especially in its relation to the protection of the headwaters, the prevention of floods and the regulation of streams; that we indorse and approve the work of the United States Geological Survey, particularly in the Hydrographic and Topographic branches, and strongly urge on the Congress a more liberal support of these branches of the public service; that we approve and commend the work of the Bureau of Soils in its soil surveys, and especially in its demonstration of the adaptibility of soils to particular crops throughout the arid region, and urge on the Congress the extension of this branch of the service on a larger scale; that we commend the operations of the Bureau of Plant



IRRIGATION WORK IN THE WEST

A Concrete Distribution Structure on the Salt River (Ariz.) Project

Industry in the introduction of improved crop plants adapted to arid conditions; that we approve the work of the Weather Bureau and urge more extended determinations of rainfall and climate throughout the western United States; that we indorse and approve the work performed in the offices of Drainage and Irrigation Investigation in the Department of Agriculture; that we commend the plans adopted by the Federal Government for a more complete use and coordination of our living waters for irrigation, water supply, power and navigation, to the end that this great resource may be the greatest good to the greatest number of our people; and that we favor the movement toward the wiser use and conservation of all of our natural resources recently started by the President of the United States and the governors of the several states at the instance of the Inland Waterways Commission.

Whereas, an accurate knowledge of soil conditions is essential to the profitable development of irrigation and agriculture in tne arid region, and whereas the Bureau of Soils of the United States Department of Agriculture is supplying this as rapidly as appropriations will permit, therefore, be it

Resolved, That the Congress of the United States is respectfully urged to support the work of the bureau with a liberal appropriation.

Whereas, the Congress of the United States, at its fifty-fifth and fifty-sixth sessions, reduced the appropriation for the topographic and water resources branches of the United States geological survey from $350,000 to $300,000, and from $200,000 to $100,000, respectively, and whereas the work of these branches of the public service is especially vital to the development of the arid region because of the necessity of accurate predetermined knowledge of the water supply available for irrigation, and the topographic conditions controlling its use; therefore, be it

Resolved, That this congress respectfully and emphatically urges that these appropriations be restored to the original amounts at the coming session.

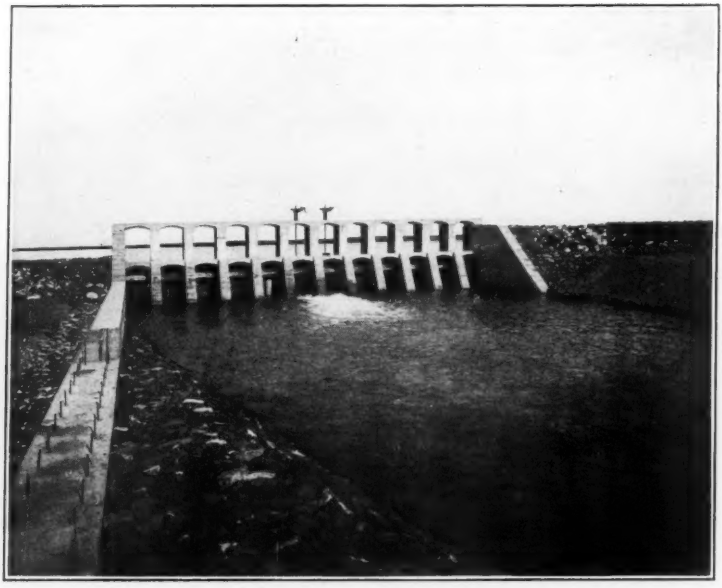
That this congress recognizes the growing importance of the development of electric power, not only for the purposes of lighting, manufacturing, and commerce, but also in aid of irrigation by pumping from subterranean sources. Developments already accomplished in this direction warrant the assumption that, in the not far distant future the lands irrigated by water pumped from such sources will equal, if they do not exceed, lands irrigated from the natural flow of streams. The development and use of our streams for the generation of electric power not only aids and increases irrigation directly, but is beneficial in many other ways. First, it renders possible and profitable the construction of reservoirs in the high mountains, withholding excessive floods, thus aiding reclamation and also conserving this injurious flow which is later added to the beneficial flow of water available for irrigation. Second, it is the one great source of supply immediately available for lighting, heat and

A NORTHWESTERN IRRIGATION TOWN

View of Hermiston, Oreg., on the Umatilla Project. Irrigation Brought This Town into Being

A COLORADO IRRIGATION CANAL

Detailed View of Completed South Canal on the Uncompahgre Project



A BIG IDAHO DITCH

Headworks on the Main South Canal of the Minidoka Project

power, as a substitute for other fuels, thus limiting the rapid destruction of our forests and also conserving and saving our supplies of coal and other fuels. Third, the use of electricity for pumping renders it possible permanently to reclaim and irrigate vast sections of our arid lands otherwise impossible of irrigation or reclamation. Fourth, its extensive development will cheapen and extend manufacture and commerce, thus affording an immediate home market for the products of our irrigated farms and also cheapen transportation to other markets. Therefore, be it

Resolved, That the necessary rights of way and rights for the construction of reservoirs and other uses of the public lands, for the development of electric power, should be aided and encouraged in every reasonable way, and all such rights and uses should be granted and allowed upon equal terms with similar rights granted for the direct purpose of irrigation. Such uses being public uses subject to the control of the state, should continue so long as the right to the beneficial use of the water and the duty to supply the power continue under state laws. And no burdensome charges or discriminations should be exacted or imposed as a result of which such beneficial developments may be delayed and the investment of capital therein prevented and the cost increased to the customer.

That the national government, as a part of the comprehensive national policy of internal improvements for river control and regulation and the construction of inland waterways and utilization of water power, and for the enlargement to the utmost possible extent of the area of the country available for agriculture and homes on the land, and for the protection of those homes from either flood or drought, shall build not only levees and revetments where needed, and drainage works for the reclamation of swamp and overflowed lands, but shall also preserve existing forests, reforest denuded areas, plant new forests, and build the reservoirs and engineering work necessary to safeguard against overflow, and save for beneficial use the flood waters that now run to waste.

That a census of the standing timber in the United States should be authorized by Congress, and that the states should be urged to cooperate with the nation for the preservation and enlargement of our forest resources, by the adoption of uniform forest laws and systems for forest protection, and the preservation and right use of the forests, and that forestry, irrigation, drainage, flood protection, water storage, and river regulation and control for navigation and water power should be regarded as one great interrelated subject in all legislative and executive policies.

That power made available by national irrigation works, when once applied to pumping or other duty connected with irrigation,

IRRIGATION IN KANSAS

The Great Eastern Ditch, on the Garden City Project

should be regarded as appurtenant to the land, and we urge the enactment of laws to this end.

That in indorsing the work of the United States Reclamation Service, we especially commend the plan of cooperation between the settlers and the Federal Government whereby settlers receive credit on their water rights in exchange for labor and material.

That we heartily commend and urge the continuation of the work of the United States Geological Survey in the investigation of the artesian and other underground waters of the arid West.

That we approve and urge the continuation of the wise policies of the states and counties in saving life and preventing suffering in the arid region by providing desert wells and water-saving devices, by erecting permanent guide boards and by providing penalties for their removal or defacement, and by protecting springs, wells, and waterholes from contamination under severe penalties; and that we favor the cooperation of the United States Geological Survey with the states and counties in locating and maintaining these water sources and in disseminating accurate information concerning them, through maps and reports.

That in commending the reclamation act of 1902, we express our satisfaction with recent demonstrations of the large importance of underground waters; and that we favor the utilization of this great resource for irrigation just as the surface waters are utilized, using pumps and other water-raising devices as adjuncts and parts of the irrigation works.

That we favor and urge upon Congress the early repeal of the Timber and Stone Act, to the end that the accumulation of the public timber lands in the hands of a few great corporations may be avoided.

That we strongly urge upon Congress the speedy creation of the Southern Appalachian and White Mountain natural forests.

That this congress heartily indorses the policy of the present administration in its efforts to preserve timber lands throughout the Union, and we earnestly recommend to the several states their cooperation in the work of preserving the forests in their borders, and recommend in every state the creation of state and national forest plantations, sufficient to supply the demand for wood and timber of the people of such state. While appreciating the importance to the West and the entire country of the protection of our forest by every adequate means, we favor the highest utilization for all economic purposes of all our public lands.

We therefore recommend that an adequate appropriation be made at the next session of Congress for the use of the hydrographic division of the geological survey to determine by experiment, measurement and observation the practical effects of grazing and lumbering on the supply of water for irrigation, and on the erosion of soil, and silting up of streams and reservoirs, and we recommend that such investigations extend over the en-

tire watersheds both in and out of national forests, and that such investigations be prosecuted simultaneously throughout all the states and territories in the arid and semi-arid West.

The importation of free tropical sugar in competition with our home product would be destructive of the domestic industry. We therefore urge our Representatives and Senators to earnestly oppose the enactment of any legislation that would allow such competition.

That we favor the adoption of vigorous measures in each of the trans-Missouri arid and semi-arid states and territories to secure the creation of immigration bureaus,

That whenever large tracts of land suitable for agriculture and which are not natural forest, and which are not intended to be made forest and which are not necessary or proper for the preservation of the forest or the watershed or water supplies for the purposes to which they have been devoted, lie within forest reserve boundaries, such tracts should be restored to entry as public land.

That we urge the Congress of the United States to amend the so-called Carey act, so as to make it apply to the territories as well as states.

That it is desirable that this congress shall cooperate so far as it may be able, with the National Conservation Commission for the

AN ARIZONA IRRIGATED RANCH

Canal at the McQueen Ranch, in the Salt River Valley, near Mesa, Ariz.

supported by liberal appropriations, in order that reliable and official information may be available for the benefit of homeseekers.

That this congress expresses its appreciation and indorsement of the tree-growing movement being promoted by the Federation of the Tree Growing Clubs of America.

That it is the sense of this congress that such legislation should be had, in justice to the Forest Service and claimants to property rights within national forests, as will provide for a review at the instance of any party affected, by a competent tribunal, of controversies relating to homestead entries, or forest control or regulation, or arising from any action, regulation, or the ruling of forest officers.

promotion, and accomplishment of its purposes, and the president of this congress is authorized and directed to appoint a committee to be known as the conservation committee of the National Irrigation Congress, which shall consist of the president of this congress and four other members, to be appointed by him, to cooperate and aid the National Conservation Commission in its objects and purposes in so far as they coincide with the objects and purposes of this congress.

That in harmony with the report of the special committee authorized by the Fifteenth Irrigation Congress, we urge the importance of holding an early session of this congress,

at Washington, D. C., and authorize the president of this congress to appoint a committee of three, to communicate with state and territorial legislatures, with a view of securing appropriations and of taking such other steps as may be necessary to effectuate the purposes of this resolution, such committee to report at the seventeenth session of this congress.

Whereas, the members of our National Congress at Washington should be familiar with the sentiments which find expression in the resolutions adopted by the National Irrigation Congress at its annual sessions. Now, therefore, be it

Resolved, That the president of the National Irrigation Congress be empowered to appoint a committee of five to be designated as the Congressional Committee, whose duty it shall be to present the resolutions adopted by this congress to the National Congress at the session following their passage by this congress and to urge their importance and the necessity of their recognition by the National Congress.

Resolved, That the congress extends its sincere thanks to the territory of New Mexico, and the city of Albuquerque, its commercial organization and citizens for the hearty welcome and generous hospitality which have been extended to the members of this congress; also

To Governor Curry, and to the other officials of the territory and city for their courteous care for the welfare and comfort of the delegates;

To the governments of France, Brazil, Chile, Canada, Cape Colony, Germany, Italy, and Mexico for the interest and recognition shown in the appointment of delegates to the congress;

To the press of the city, territory, and country for the consideration shown in the reports of the proceedings;

To Frank C. Goudy for the frank and impartial manner in which he has presided over the deliberations of the congress, and

To B. A. Fowler, the efficient secretary of the congress;

To W. S. Hopewell and R. E. Twitchell, chairman and secretary of the board of control, for their untiring efforts in perfecting the highly successful arrangements for the congress.

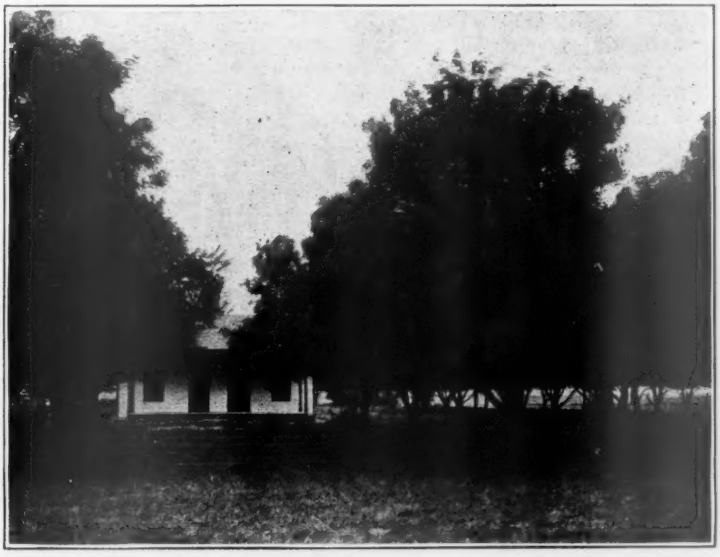
To Miss Caroline Strong, the conductor, to the quartet, and to the chorus of ladies and gentlemen who furnished the excellent musical program for the congress; also

To John J. McClellan, the author and composer of the Irrigation Ode;

To the Mexican Government for the presence of the Regimental Band, of the state of Chihuahua;

To the Atchison, Topeka & Santa Fe Railroad Company for its enterprise and effort looking to the success of the congress.

That this congress requests that the report of the proceedings of its sessions be published within thirty days.



A KANSAS FARM

Shade Trees and Orchard on the Garden City Irrigation Project

NATURAL MOVEMENT OF WATER IN SEMI-ARID REGIONS*

By W J McGEE, LL.D

Secretary, U. S. Inland Waterways Commission

THE average annual rainfall on mainland United States is estimated at thirty inches; the aggregate at 200,000,000,000,000 cubic feet. This is the yearly boon from the heavens, the virtual source of every industry, indeed of habitability. Without it the land would be bare rock or sun-scorched sand; the lower atmosphere without the tempering influence of the moisture would range from below freezing to boiling temperature from night to day; and no living thing could exist.

This annual water supply, as our primary resource, may be counted our capital. Without it no other resource would possess the slightest value. Of it the amount varies slightly from year to year; yet there is no more. It may be used or wasted; in the end, if we are wise, it will all be used, regulated, and controlled in such manner as to yield the greatest good to the greatest number for the longest time.

Taking mainland United States as a whole, our 200,000,000,000,000 cubic feet of liquid capital may be expressed as ten Mississippis. About one-fifth of all, equivalent to two Mississippis, flows through waterways into the sea, while five or six Mississippis in quantity are evaporated to temper the air, form dews, and in part redescend as rains or snows. A part of the remainder seeps into the soil below the surface, or permeates deeper rocks; and it may be estimated that something like a tenth of the whole, or an equivalent of a Mississippi, is utilized in plant growth and in animal assimilation. It is this fraction which is of most immediate and general use to mankind.

The distribution of the natural supply varies with seasons; it varies still more widely with regions. Approximately two-thirds of the aggregate amount falls on the eastern two-fifths of the country; the remaining third on the lion's share of our territory lying west of the ninety-fifth meridian—for the average west of that meridian is only about eighteen inches, while that of the eastern fraction is some forty-eight inches. Within the larger western area the range is greater than in the east—from over sixty inches on the northwestern coast down to less than one-tenth of that in certain arid spots of the southwest. The distribution by what may be called function is also wider in the larger western area.

In defining the natural functions of the water resulting from rainfall, it should be noted that scarcely anywhere in the United States is the rainfall excessive, i e., greater than can be used beneficially by growing plants, living animals, and intelligent men (as is the case in certain tropical countries); nearly everywhere it falls below the aggregate best adapted to organic development. Thus eastern United States might produce more abundant crops, develop greater industries, and sustain a larger population with a well-distributed rainfall of sixty inches than it is able to do with the mean precipitation of forty-eight inches. With a rainfall of sixty inches, and with other climatical features as they are, probably half of the aggregate would evaporate,

*Read before the National Irrigation Congress at the sixteenth session, held in Albuquerque, September 23-29, 1908.

when its function would be to temper the atmosphere, form dews, etc.; probably another quarter would flow into the seas, and might be utilized for navigation, power, etc.; while the greater part of the remaining quarter might be utilized in vital and chemical functions (including plant growth), all subject to more or less definite human control.

Throughout the western three-fifths of the country the precipitation is far less than that required for the highest organic growth—except in so far as human genius and creative capacity can improve on the processes of nature. Here probably no more than a tenth of the rainfall runs back to the sea; excluding the northwesternmost districts, in which the precipitation is high, probably no more than a twentieth so leaves the land. The evaporation is larger than in humid lands, probably exceeding three-fifths and possibly three-fourths of the rainfall; it would be far greater were there more water to evaporate; and the quantity evaporated is not enough to temper the atmosphere completely, so that dews are scant and the daily range of the thermometer is wide. Probably less than a tenth, perhaps no more than a twentieth, of the total rainfall remains available for the most important function of all, i. e., the sustenance of organisms, including plants, animals, and men.

Neglecting the loss by deep seepage and a few other minor factors, the great functions of water are (1) evaporation to temper the atmosphere; (2) returning to the sea, thereby removing excess of earth-salts and affording facilities for navigation and power; and (3) entering into chemical combinations largely in organic growth. The portions of the water involved in these functions are sometimes denoted the fly-off, the run-off, and the cut-off; and other things equal the benefit to plants, animals, and men, is proportionate to the cut-off. Now, in all portions of the country the fly-off and the run-off are greater, and the cut-off proportionately less, than required for highest productivity; and in the larger western portion the distribution is much less favorable than in the smaller eastern portion. Such are the primary natural conditions; yet, especially in deserts, both nature and man have improved on these conditions in ways affording greater promise to prospective human development than can be found in any other direction—the promise that the desert shall blossom as the rose, and that the people of our vast semi-arid regions shall in good time guide the ship of state and direct our moral emprise.

In a state of nature, the running waters of arid regions comport themselves differently from those of humid lands. In the latter it is the law of running water to gather into streams which make for themselves channels and gradually shape the entire land in forms permitting the water to flow down to the sea with greater ease and swiftness. Not so in arid districts; here it is the law of running water not to gather into streams, but to spread into sheets facilitating soakage and evaporation into the thirsty soil and air, so that the water tends to remain on the land instead of flowing seaward; and during the ages these sheet-floods tend so to shape the land surface as progressively to reduce the run-off seaward, and progressively increase the ratio of water retained. It is this peculiar law of running water, coupled with the slow but ever acting work of the winds that yields the distinctive forms of arid landscapes—those combinations of far-stretching plains with rugged and precipitous ranges wide-scattered between, giving the effect of lost mountains buried to shoulders in their own debris. At last railway engineers are learning the law of the desert water—they are finding that to make culverts useful on the gently sloping plains they must build out wing-dams to concentrate the sheet-floods, which, on passing the obstructions, quickly spread again Such is nature's device in arid regions for retaining water on the land rather than throwing it quickly back into the sea; plants and animals have unwittingly learned of it; and it behooves mankind

first to learn and then to improve on nature's ways.

In the driest portions of our vast semi-arid region the plants are peculiar. Among the prevailing types, leaves are few and small, or else unfold quickly during the rainy season to wither at once when that short season passes. Such typical desert forms as the cacti never leaf at all; they are virtual reservoirs of water, retained by a glazed epidermis, and distributed throughout tissues largely of starch and cellulose abounding throughout in chlorophyll—that marvelous substance which enables plants to absorb the energy of light, and by some obscure alchemy to convert it into vital power. In a word, the desert plants are *par excellence* water-conserving organisms; they are nature's devices for making the best and largest use of a scant water supply. By nature's methods these plants and their associated animals have been evolved together through the bitter strife for existence against the common enemies of sun and sand.

The vital processes of the desert organisms are adapted to the retention and utilization of water. The gigantic sahuaro and titanic sahuesa absorb water literally by barrels, fattening enormously during and after each rain; the nopal and the cholla drink by the bucketful and the bisnaga by the gallon, perhaps for the benefit of animals and men during the next dry season. They can hardly take water direct from the air, since their glazed skins are impervious, but their rootlets suck liquid from the soil and perhaps draw moisture from the air permeating it; and it is probable that during prolonged rainless periods they convert a part of their own starch and cellulose into the water required for vital circulation. Similarly, the animals of deserts have become adapted to life with less water and taken at less frequent intervals than the animals of humid lands; certain desert mice indeed living for months and years absolutely without drink through digestive decomposition into water and carbonic acid of the starch contained in the seeds on which they subsist. Such are among nature's ways of making the best and largest use of the scanty water supply of arid regions.

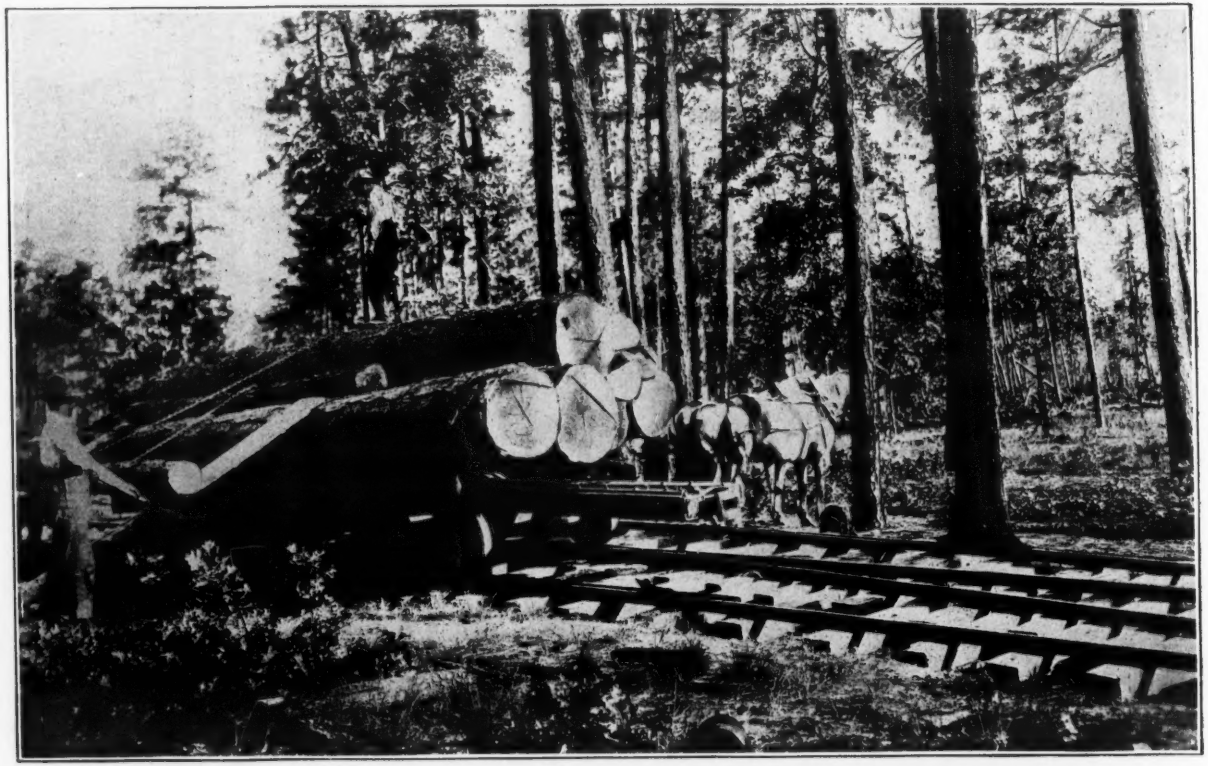
In our great Southwest the aborigines adapted themselves to the arid conditions in a manner nothing less than marvelous to the anthropologist. At a period some three to five centuries before Columbus came (before certain exterminating intertribal wars arose), the region traversed by the Southern Pacific Railway between El Paso and Bakersfield sustained an aboriginal population probably three to ten times greater than the present mixed population sustained in part by imported products. In the magnificently irrigated Salt River Valley the modern ditches are less extensive and reach a less extended area than the ancient acequias; while prehistoric represos and temples and houses dot deserts where now no man lives. These ancients were largely agricultural folk; their descendants survive in the Papago Indians of the farther deserts, and in part in the Pueblo peoples of the mesas; and it cannot be questioned that they were populous throughout this hard region by reason of their success in adjusting themselves to natural conditions and ways of nature, and making the largest and best use of their scanty water supply. The devices retained by their survivors are too many for telling in an hour; yet they are well worth study, and it behooves modern man entering on the conquest of the deserts to first learn and profit by and then improve on their methods.

A single lesson may be drawn in passing from the customs of desert folk on this continent and others. Just as the plants and animals of our deserts grew up in mutual adaptation and interadjustment through common strife for survival against sun and sand, so the native tribesmen entered into the same solidarity; and the plants and animals and men strove together. One effect was to establish a community of feeling, centered on water as the chief source of life, the most precious of all commodities; and those tribes and

groups and pairs enjoyed the best chance of survival who most generously interchanged this priceless boon. So arose that altruism which distinguishes all the higher types of mankind from all lower types; and it was thus in accordance with natural law that the world's civilization naturally and necessarily arose in the world's deserts. Thereby is history's tale verified and justified; for the world's greatest inspirations have been born where the intensity of life and of human motive is greatest—and the desert germs have spread and blossomed throughout the entire world to the benefit of all mankind.

During recent decades the examples of other dwellers in arid lands have been followed with advantage in our country. The fig and the date and durum wheat have been introduced, and dry-farming has been adopted; and thereby the habitability and productiveness of our greater western territory has been increased. Yet it is worth while to inquire whether the most promising line thus far opened is not that of directly improving on nature's devices in our southwestern districts—of Burbanking cacti and other plants, and by extending the field of invention into vitality, progressively recreating the natural fauna and flora along the lines started by nature but at a more rapid rate. The work of our desert laboratories has but begun; yet already they are pointing the way toward almost unlimited improvement among organisms adapted to arid environments. The pre-Columbian natives produced figs from thorns; now comes MacDougal, getting grapes from thistly cacti. And it is not too much to hope that their methods, coupled with extension of irrigation up to the full capacity of the rainfall, will largely reconstruct the flora and fauna of the arid lands and greatly enrich the same arid regions. The ideal to be kept in mind is that so clearly indicated by the natural movement of waters in arid districts—the retention, conservation, and full utilization of the entire rainfall. The fly-off can hardly be reduced, though with every increase in vegetal covering it can be better utilized, and may even be made to produce more abundant dews if not increased local rainfall; the storm run-off can be and should be checked, leaving only enough to carry away excess of earth-salts; and the effective cut-off can and should be increased somewhat in quantity and greatly in efficiency.

Nor is this the end; for when the people of the arid and semi-arid territory make conquest of land and water for their own benefit, they will bring even greater good to the rest of the Nation in clarified views of relations, of the real bases of National prosperity. It is in the nature of things that inhabitants of arid lands first come to realize the priceless value of water as the prime necessary of life; and their customs, and eventually their laws, grow wise and beneficent. Had our country been settled from the Southwest instead of the Northeast, we should have had a more judicious body of statute and a more widely applicable common-law than now; and it is not too much to hope that the most significant chapters of human history will be repeated, and that the inspirations and beneficences begotten in arid lands will again make their influence felt—and that our National culture and statecraft may be bettered through the intensified vitality and exalted spirit of our deserts. Some day the wisdom of Arizona and New Mexico will be infused into our Constitution, not by amendment, but by interpretation and common judgment; and with it will come a closer union of States than that which first made our colonies a Nation, a union based on that fundamental resource that gives value to all the rest.



LUMBERING IN THE SOUTH

Skidding Long-leaf Pine Logs in a Louisiana Lumber Camp

THE LAKES-TO-GULF CONVENTION AT CHICAGO

THE third annual convention of the Lakes-to-Gulf Deep Waterway Association, held in the Auditorium Theater, Chicago, October 7-9, was notable in several respects. In the first place it is claimed to be the largest waterway convention ever assembled in the United States, the official roster comprising some 4,300 delegates from forty-four states; and in the second place, it brought together for the first time in American history, the Presidential candidates of the two great political parties to occupy the same forum, and essentially the same platform so far as concerns the paramount issue now before the American people—that of improved transportation through waterway development. It was even more notable in that, for the first time in such an assemblage, no effort was made to solicit the favor of Congressional leaders, or to get any public men on record; the position assumed being that of citizens representing a majority of the people determining in convention the lines of policy which the people demand shall be carried out. Conformably with this position, the address of the President was one of the broadest and most stalwart utterances ever made in a waterway convention; while the resolutions framed by a committee drawn from some thirty states and unanimously adopted by the entire Convention are far and away the most comprehensive, constructive, and vigorous thus far framed in the waterway interests of either the interior or the country at large.

After assembling on the morning of October 7, the address of President Kavanaugh (printed in later paragraphs) was delivered; it was followed by a notable report submitted by Secretary Saunders. At eleven-thirty Judge William H. Taft was introduced and received a stirring ovation. He delivered a scholarly and effective address, indicating the need for waterway improvement on a comprehensive scale, pointing out the defects in the methods hitherto pursued, and explaining the policy of the present and prospective administration regarding the complete control and utilization of running waters for navigation and all related purposes by methods involving cooperation between the Federal Government and states. The address elicited great enthusiasm.

The afternoon was devoted to an inspection of the great sanitary drainage canal connecting Lake Michigan with the Illinois River, by means of special trains and barges provided by the Chicago Association of Commerce, the host of the convention. Delegates and other guests (including ladies) filled four special trains on the Santa Fe Railway.

No exercises were set for the evening by the association; but several of the officers and delegates, including the Governors, Senators, and Representatives in attendance, were guests at the fourth annual dinner of the Chicago Association of Commerce, in the Auditorium Hotel, in celebration of the rebuilding of Chicago since the fire of 1871. This function was made especially notable by the presence at the same board, at either side of President Richard C. Hall, of Judge William H. Taft, and Hon. William J. Bryan, as chief speakers.

During the morning session of October 8 a most effective paper, emphasizing the necessity for waterway improve-

ment and urging that the work be done by direct Federal appropriation, rather than on a bond basis, prepared by James J. Hill, of the Great Northern Railway, was read by Congressman Rainey. At eleven-thirty Hon. William J. Bryan was introduced and received a striking ovation. He delivered an eloquent address, urging the pressing necessity of waterway improvement on a comprehensive plan comprising the conservation of all natural resources relating to the running waters, and indicating the definitely constructive policy for which he stands. The address evoked enthusiastic applause.

The feature of the afternoon session was an address by Hon. Gifford Pinchot, Chairman of the National Conservation Commission, on the subject of "Waterways and the Conservation Movement." Mr. Pinchot defined conservation as the application of common sense to the common good, and explained in detail the necessity of proceeding along broadly constructive lines in the improvement of our waterways in such manner as to secure for the people of the country generally the full commercial and industrial benefits to be derived from the control of the waters, themselves ranking among our richest resources. The address received close attention, and evoked emphatic expressions of approval. The remainder of the afternoon was devoted to five-minute talks by delegates, which did much to crystallize sentiment and determine the character of the convention.

The evening was devoted to a reception in the Coliseum, at which Hon. John Temple Graves delivered an eloquent address, strongly commending the waterway movement.

On Friday morning several committees reported that on nominations recommending the reelection of the former officers, which was done with enthusiasm; the list including Mr. W. K. Kavanaugh, of St. Louis, President; Vice-presidents from the interior states; Mr. W. F. Saunders, of St. Louis, Secretary; Mr. George H. Monroe, of Peoria, Treasurer; a Board of Governors chosen from the interior states, and an Advisory Council, consisting of the executives of the commonwealth's most affected by the project for a lakes-to-gulf deep waterway.

The election was followed by the address of Col. John A. Ockerson, of the Mississippi River Commission (U. S. Delegate to the International Congress of Navigation, recently held in St. Petersburg), entitled "What Europe is Doing with Waterways." The speaker pointed out that while our railway facilities are superior to those of Europe in economy, this advantage is more than counterbalanced by the greater distance of freight movement in America; and that Europe is so much better advanced in waterway development as to give this country object lessons which must be first followed and then carried further if our commercial supremacy is to be maintained. He was followed by Mr. Theodore P. Shonts, President of the Chicago and Alton system paralleling the line of the lakes-to-gulf deep waterway (also President of the Interboro Rapid Transit System of New York, and formerly Chairman of the Panama Canal Commission) in an address on "The Future of Rail and River Transportation." Mr. Shonts held, as does Mr. Hill of the Great Northern, Mr. Harriman of the Illinois Central, Mr. Finley of the Southern, and all other leaders among the railway systems paralleling the Mississippi and its tributaries, that the improvement of navigation in, and the restoration of commerce to these rivers will not only be advantageous to the railways, but that it is imperatively required in order that the railway systems may be made of the highest value to the people of the country traversed by them. Both addresses evoked great applause.

The consideration of the report of the resolutions committee was assigned for the afternoon session; but on a vote it was called for during the morning session and was submitted by the chair-

man, Mr. Alexander Y. Scott, of Mississippi. It was accorded a most favorable reception, many of the paragraphs being roundly applauded; and after brief expressions of commendation it was unanimously adopted. After authorizing the President to appoint a committee of fifty to lay the resolutions formally before the President of the United States, the Vice-president and the Speaker of the House of Representatives, the convention adjourned to reassemble in New Orleans in November, 1909.

During the afternoon the delegates were accorded a unique treat by the members and friends of the Chicago Association of Commerce, in the form of an automobile ride of forty miles along the lake front and through the leading parks and business districts of the city—the unique character of the event lying in the fact that there were 1,000 automobiles in the procession, forming a line some five miles long.

The address of President Kavanaugh follows in full:

A paramount issue confronts the people of the United States. In technical English this issue may be expressed in the question: "Shall our Natural Resources be Conserved and Developed?" With equal truth, this issue may be expressed in the broader question: "Shall our National Prosperity be Promoted and Perpetuated?" For the conservation and development of our natural resources equals the promotion and perpetuation of our National prosperity.

It is a noteworthy fact that this issue has become paramount since the creation, two years ago, of this, the Lakes-to-the-Gulf Deep Waterway Association, whose principal object is the development of those great natural resources, the Mississippi and its tributaries.

Other organizations of citizens have helped to raise this issue. Much has been done by different river improvement associations of the interior and the Pacific coast; by the Atlantic Deeper Waterways Association, created a year ago, along lines similar to those of this association; by the Trans-Mississippi Congress, the National Irrigation Congress, the Upper Mississippi River Association, the Missouri River Improvement Association, the Ohio River Improvement Association, the Arkansas and Red Rivers Improvement Associations, and especially by the National Rivers and Harbors Congress, whose field is the entire country. We disparage no other organization, no other movement. All are needed, and we cordially invite cooperation. Yet it is a fact that this association was more largely instrumental than any other in securing for the great policy of waterway improvement the unqualified support of the National administration, and the equally vigorous support of all the leading political parties. Hence this association may fairly claim a large measure of the credit for that paramount issue which has arisen for decision by the American people.

The field of this association is a favorable one. Occupying the very heart of the country, it has become so rapidly the real center of the country's growth, activity, wealth, and power, that many have failed to follow its progress. In area, it is one-half the United States; in number of states, it exceeds a score, including all those commonwealths which are richest in agricultural and mineral output; in population it has grown more rapidly than any other section of the country, until to-day in the states drained in whole or in part by the Mississippi with its tributaries and by the other rivers flowing into the Gulf on the south or the Great Lakes on the north, live fully one-half of the citizens of the Nation; and reckoned by the proportion of free holders and independent producers, it includes much more than one-half of the Nation's effective population. The time has come for these citizens, the bone and sinew, the brain and intelligence of the Nation, to speak for themselves, for their interests, for their posterity, for *the Fate of the Nation, yea, that of civilization and enlightenment, rests in the hands of the sturdy sons of this, the Great Mississippi Valley.*

The Interior Empire is drained by the greatest river of the Continent, one of the greatest in the world, the mighty Father of Waters, which, with its tributaries, reaches from our Northern boundary to our Southern limits, and from the Alleghany Mountains on the East to the Rocky Mountains on the West.

In early days, settlement of the Great Valley was rendered possible by navigation of the main river, the Ohio, and other tributaries. At a later time, the Missouri, Arkansas, Red, White, and other rivers opened the way to settlement and development of the vast area, stretching to the foothills of the Rocky Mountains. So long as pioneer conditions continued, all the larger rivers were freely navigated, albeit with the difficulty which pioneers expect to overcome, and which they have the heart and the strength to overcome —else they would not be pioneers. Half a century ago, even one-third of a century ago, the Mississippi and its mighty affluents carried steam packets, barges, and other water craft in hundreds. The rivers were the chief theater of activity throughout the interior; they made our commerce and production; they brought culture; they made our Nation. Then the reaction came. When the pioneers tired of striving against obstructions,

many of them increased by settlement, they appealed to the Nation for assistance in overcoming the obstacles—in maintaining a river commerce sufficient to meet the needs of the growing population and production. Now, we are hopeful and progressive American citizens, yet we are not *blind*. To-day we must realize that the appeal to the Nation fell on deaf ears. The Nation did not respond. As the President of the United States recently said, there is less commerce on the Mississippi and its tributaries to-day than there was fifty years ago. The great packets and busy barges are gone. Their disappearance marks the blackest chapter in the history of the American Nation—a chapter of National indifference or incompetence, of bitter disappointment, deep discouragement, and serious loss to the people. To-day the strength of the Nation lies in the interior. How much greater would that strength have been had the National councils performed their duty and afforded proper facilities for commerce!

The decline in our transportation cannot justly be charged to any particular agency, such as the railways; for as a matter of fact, railways and waterways are and always should be complementary agencies for the carriage of freight and for other traffic—and it is especially gratifying to note that since this Association was created, the leading railway men of the Nation have signified approval of the waterway policy, and have been among the most effective workers in this association.

But why have the National authorities failed? Surely not because of fear of imposing a tax on industry and property, for the indifference, the failure to supply adequate transportation facilities, has always been and is to-day a heavier tax on the energy and enterprise of our people than any other; in fact, heavier than all others combined. Growing communities need and can bear a just taxation; but no community or country deserves or can bear up under the taxation of indifference and incompetence.

What is true of the Mississippi Valley is in some measure true of every section of the country. The rivers of the Atlantic, Pacific, and Gulf coasts require development. Our canals, once a great means of enrichment of the country, should be restored. We, of this Association, are sought and encouraged with the valuable efforts of other sections to find relief from that burden of taxation pouring out of a dilatory and indifferent waterway policy; yet we hold—and we challenge any and all to dispute our claim—that since the Mississippi is our greatest river, draining half our country and sustaining half our population, it must be the central feature of any plan for waterway improvement. We, of this Association, therefore urge the adoption of a broad and vigorous policy of Waterway improvement. Let it begin with the Mississippi and let other rivers and other sections follow as rapidly as practicable; let us, as citizens of the common country, unite with those of other sections in advocating a broad policy, and let us urge on them the wisdom of joining us in our demand for a plan of waterway improvement, beginning with our main trunk line; and let us make it clear that we no longer beg nor crave the indulgence of the Nation, but that as constituents of the Nation and a majority in numbers, we ***demand*** that the National duty be performed, and that promptly! What we need, and what this association seeks, is a broad and sound National policy of waterway improvement, and a definite purpose in carrying out this policy.

Experts declare that our waters form our richest resources, giving value to all the rest. They tell us that our waterways cannot properly be improved without at the same itme improving the lands on which the waters gather, improving the forests about the headwaters of streams, and reducing the drain on the iron and coal now required to transport by expensive agencies the abundant products of our fertile fields and rich mines.

We concur in every claim for the conservation of our resources and repeat the demand in the interest of this association and the states it represents; yet we insist that any and all plans for the conservation of our natural resources must and shall begin with the improvement and proper utilization of our waterways for the purpose of navigation and commerce.

Let us not be understood to lay undue or excessive blame on the Nation for the decline of our navigation—the failure of our water transportation. This would be glaringly unjust in view of the chief result attending the work of this association. At the instance of the Board of Governors of this association—a board than which none other was ever more courageous, devoted and self-sacrificing—the President of the United States appointed the Inland Waterways Commission to perfect the plan on which this association was already at work. On the joint recommendation of that Commission and this association, the President of the United States a year ago visited the Mississippi, and, for the first time in the history of the country, made it clear that the administrative branch of the Federal Government is determined to enter into and carry to successful completion a broad policy of waterway improvement just as rapidly as the legislative branch will permit. Nor can we forget that since this association was created, a large number of National Senators and Representatives, together with the state governors and legislators, have signified their adhesion to that policy, and have undertaken to see that it is carried out. These wise and devoted statesmen are too many to be mentioned now, their names, with those of the President and his Cabinet, will form the roll of honor in

this, our second great American Revolution —a revolution against the tyranny of transportation.

Let the great army of delegates gathered here to-day imbibe this revolutionary spirit, and let each carry back from this convention to his post of duty sufficient enthusiasm to assure the election of candidates for Congress who are willing to pledge themselves to work for the great policy of waterway improvement!

Following are the resolutions adopted:

This, the third Lakes-to-the-Gulf Deep Water Convention, the largest waterway convention ever assembled in the United States, including some 4,000 delegates from forty-four sovereign states of this Union, representing the commercial, agricultural, manufacturing, and mercantile interests of the entire Mississippi Valley, and having deeply in mind and at heart the prosperity and welfare, not only of the People of the Mississippi Valley, but of the whole Nation, and realizing that the moral and spiritual stamina and growth of the Nation as a whole depends upon the material welfare and prosperity of the individual citizen, do hereby—

Resolve and Declare: To promote the general welfare is recognized by the Constitution of the United States as one of the fundamental principles of government.

The general welfare of the People of the United States can best be promoted by establishing the commerce of the country on a sound basis, and by so enlarging it that agricultural and mineral resources may be developed to the end that production and manufacturing may be encouraged and that all other lines of independent business may be increased.

Easy and adequate transportation, effective between producer and consumer, and for carrying the abundant produce of the country to the seaboard for shipment abroad, is the first essential for the development of the commerce of the United States; and the responsibility for this development rests on the general government.

It has been demonstrated during the past ten years that when business conditions in the United States are normal, the transportation facilities afforded by the railways are utterly inadequate; and it is stated by the great traffic managers of the railways that the development of railway facilities cannot keep pace with the increased demands upon them. The leading railway authorities, including prominent officials of all the great lines which parallel the Mississippi, declare that water transportation must be developed to supplant the railways in order that the freight of the country may be handled properly and promptly.

Under the Constitution the regulation of commerce between the States devolves on the general government, and under those decisions of Chief Justice Marshall, which are universally accepted as our best interpretation of constitutional powers, the control of waterways and the regulation of navigation also rest with the general government, and neither States nor private capital can be permitted under the Constitution to assume these duties.

The duty, therefore, devolves on the general government to give to the country adequate transportation facilities by developing the navigable waterways of the country into complete freight-carrying usefulness. This duty should be recognized by the Congress at once, and the waterways should be made efficient freight-carriers, otherwise the United States cannot maintain commercial equality with those other nations of the world now equipping their waterways as freight-carriers and considering their railways and waterways as complementary agencies; and in no other way can this country derive benefits equaling those of other countries from the building of the Panama Canal.

The all-important question of transportation is a paramount issue. If it be found that the current revenues of the government are insufficient for carrying out vigorously and on a broad plan the development of our waterways, the Congress should secure funds for that purpose by providing a sufficient bond issue.

The interior valley comprises approximately half the area of the United States. It is 2,500 miles in length and 2,000 miles in width. Within its boundaries lie the greatest producing states of the Union. The arms of this great river system form the boundary lines of twenty-one states, and over 20,000 miles of possible navigation. This vast valley produces three-fourths of our foreign exports. Within this valley live half the people of the entire United States; and the voice of its citizens must be heard. The foreign commerce of this important portion of the United States should go direct in American bottoms to foreign ports. Harness the rivers of this fruitful valley, and we shall have a cheap and effective means of transportation; and a mightier impetus will be given to the ship-building industry than could be given by any subsidy other than the moderate expediture required for the permanent betterment of channels.

This convention does, therefore, declare the opening of a deep channelway connecting the Great Lakes on the north with the Gulf of Mexico on the south to be an imperative duty of the general government; and that this work should be immediately begun and completed as speedily as possible.

Any plan for the inland waterway development so imperatively necessary to the material welfare of the valley should comprise a main trunk line in the form of a strait connecting Lake Michigan with the Gulf of Mexico by way of the Illinois and Mississippi rivers. The development of this trunk line

should begin at once. The improvement of the branches of this main line, such as the Upper Mississippi with its tributaries; the Ohio with its leading tributaries, including the Tennessee and Cumberland; the Missouri; the Arkansas; the Red, the White, and other rivers; and the interstate inland waterway of Louisiana and Texas, should proceed simultaneously with the development of the principal line.

The deep waterway is practically complete from Chicago to Joliet through the courage and enterprise of the single city of Chicago, which has by the expenditure of $55,000,000 created a deep channel across the main divide between the waters of Lake Michigan and those of the Mississippi. A special board of survey, composed of United States engineers, reported to Congress in 1905 that the continuation of the deep waterway from Joliet to St. Louis was feasible, and would cost only $31,000,000. The state of Illinois, assuming that the Federal Government will take the responsibility of completing the waterway to the Gulf, is about to cooperate to the extent of $20,000,000. The delegates to this convention heartily congratulate the great commonwealth of Illinois and the splendid city of Chicago on their initiative, and express the hope and belief that their example will influence other States to lead to similar effective cooperation.

A special board of survey, composed of United States engineers, was through the efforts of this association created by Congress last year, to survey the deep waterway route from St. Louis to the mouth of the Ohio, and to report to Congress the feasibility and cost of the waterway. That board will report during the winter; and we, the delegates to this convention, demand that when this report is made, Congress shall at once provide funds sufficient to begin operations in a large and effective way.

The broad plan for improving all the waterways for navigation should take account of all other uses of waters and benefits to be derived from them by the people; should consider the conservation of the natural resources of the country in their relation to commerce and navigation; should extend to forest preservation, reservoirs and other means of stream control, and the maintainance of the level of our Great Lakes in such a manner as not to interfere with their navigation and commerce; should consider floods and their prevention, together with irrigation and drainage; should take account of bank-revetment, levee-building, and other means of protecting the bottom lands and increasing their productivity; and should contemplate regulation of terminals with a view to rendering rail transportation and water transportation complementary and jointly useful to the people of the country.

This convention is in hearty accord with the movement for the conservation of the natural resources of the country, and heartily approves the efforts of the National Rivers and Harbors Congress in seeking to develop the waterways of the Nation.

Fully realizing the importance of the proposed constitutional amendment unanimously submitted by the legislature of the State of Illinois to be voted on the third of November, and recognizing in it a practical step in the direction of the realization of this project; and also recognizing in it the first great movement by any state in the matter of the conservation of its natural resources, we approve said constitutional amendment and commend it to the favorable consideration of the voters of Illinois.

We, the delegates in this Convention assembled, representing half the people and three-fifths of the productive energy of the United States, do hereby demand that a definite and vigorous policy of waterway improvement, beginning with the Lakes-to-the-Gulf Deep Waterway, be promptly adopted and put into operation by the National Government. To the enforcement of this demand we pledge our individual effort and our united support; and we pledge our personal honor, each for himself and to each other, to support no candidate for public office who will not unqualifiedly indorse and maintain that policy.

THE TRANS-MISSISSIPPI COMMERCIAL CONGRESS

By J. B. CASE, President, 1907-1908

THE nineteenth annual session of the Trans-Mississippi Commercial Congress held at San Francisco October 6-10 was marked by an unusual enthusaism and had the attendance of one of the most representative bodies of businessmen ever gathered in the West. Among its striking features was a message of greeting from President Roosevelt, the presence of his personal representative, W. H. Wheeler, of the State Department, addresses by John Barrett, of the South American Republics Bureau, and C. J. Blanchard, of the Reclamation Service.

The theme of the session was greater markets for the West and the need of more transportation facilities.

The Trans-Mississippi West has grown amazingly in fertility as better methods of agriculture have opened larger areas and have made the old areas produce more abundantly. Then the government has come in with its wonderful reclamation service and has awakened the sleeping desert. The work as a whole rivals the Panama Canal in the labor and expense involved. The employment of 16,000 men and the expenditure of $1,250,000 every month are but incidents in the service. Already the canals completed reach a total of 1,815 miles—as far as from San Francisco to Kansas City. Homes have been made for 10,000 families, where before was barren land. In the past five years $33,000,000 has been spent, and the enterprises already planned will add more than a hundred millions to this sum. Nor is this money spent in one locality. In New Mexico one of the largest dams in the world is being constructed. In California and Nevada great reservoirs and irrigation plants are being built. In western Kansas, the beet-sugar raisers have a $250,000 plant for pumping to the surface the "underflow," found a few feet beneath the top soil of the Arkansas River valley that ditches may be filled and crops made certain. On seven great projects involving the expenditure of $51,000,000 and the reclamation of over a million acres, the benefit is directly to the Northwest. These projects lie in North and South Dakota, Montana and Washington. In these states lands that have been considered worthless except for the coarsest kind of grazing, are being transformed. No private enterprise could undertake the vast plans being carried on by the government. It has excavated forty-seven tunnels, with a total length of eleven miles. Among its accomplishments are ninety-four large structures, 675 headworks, flumes, etc.; it has built 375 miles of wagon road in mountainous country, has 727 miles of telephone lines, has manufactured in its own mills 90,000 barrels of cement, and in its own sawmills has cut over 3,000,000 feet of lumber. All this indicates a work of the first magnitude. It will be returned many fold to the nation.

Out of this remarkable advancement of the Trans-Mississippi country comes one great problem that overshadows all others. Important as are the various interests which we are trying to build up, and close as are they to our national life, the present-day question before the Trans-Mississippi country is that of transportation for its constantly rising abundance of production. The one thing the farmer and the miner want to know to-day is how to get the

material he produces most cheaply and most directly to a world market. Only two methods are open, by river transportation and by railway. There are no vast inland seas, no great bays or lakes to furnish a passage for all this wealth of grain and minerals. There are rivers that flow for hundreds of miles, but offer only an indifferent method of transportation. It is pleasing to see that the government is taking an interest in the possibilities of this form of transportation and that the waterways are receiving attention. It has been one of the efforts of this congress to urge and secure assistance along this line. The government owes it to the people who occupy these fertile acres to give every possible aid in deepening and broadening the rivers that can carry our products to deep waters. It owes to these states and territories a more determined effort than ever before to improve the western harbors to which may be shipped western products. The great granary and mineral territory of the United States is going to have its rights in waterway improvement, or know the reason why.

In making these improvements the Trans-Mississippi country is most interested in those streams and harbors that touch our own states. We are particularly desirous that the navigation of the Missouri and lower Arkansas rivers be improved until there shall be a worthy advance to the transportation of our western products. Along these streams are growing cities and improved farms, and the government owes it to the men who are making a prosperous country of what was once open plain that they be given every possible encouragement.

However, only a comparatively small portion of the Trans-Mississippi country can be reached by navigable streams. We must depend upon the iron rail as a highway to market for the greater portion of our products. The railroads came into the western states and found them a trackless desert. To-day the most splendid limited trains in the world flash across well-improved and wonderfully developed areas. Trans-continental lines connect the Pacific coast with the Atlantic seaboard. North and south lines reach from the Dakotas down to the Gulf. Branch lines tap the interior and haul away the grain from the lonely prairie elevator. The railroads have transformed the Trans-Mississippi country. But every year at harvest time we hear the recurring cry of too few cars and too few engines. The prairie elevator is filled to the roof day after day, with no cars ready to haul away the grain. New towns spring up and are unable to secure freight because of the congestion at central points. Down in the corn-raising districts this fall you will see hundreds of thousands of bushels of corn heaped on the open ground, because transportation is lacking. The country has developed faster than railroad building has gone on.

Not until we study the statistics of the Trans-Mississippi country do we realize the importance of this need. When the Commercial Congress was organized, there were but 16 000,000 people here to-day there are 25,000,000. The value of farm property was given by the government census as $2,137,000,000; to-day it is $19,898,000,000. The production of the farms in the United States this year is estimated at $7,500,000,000, of which fully fifty per cent. comes from the Trans-Mississippi country, an increase of 100 per cent. in the past fifteen years. The mining industry has increased in even greater proportion. While these tremendous growths have been taking place in the value and production of the Trans-Mississippi territory, the transportation facilities have not increased in any such measure. In 1888, the railroad mileage was 68,057 miles. The statistics for last year—which are the latest available—give to this territory 102,286 miles. This increase of less than sixty per cent. is far below the needs of the richly productive area that these lines serve. It is evident to the student of commercial affairs that we need tens of thousands of miles of new railway in order to handle properly the tremen-

dous and growing output of our farm lands and mines.

Here and there a commonwealth has a mistaken idea of its own needs and attacks the railroad as an enemy, when it should have considered it an associate in its development. It is a poor policy on the part of individuals or of a community to hinder those things that make the present-day progress. Thousands of communities to-day would have railroads if the builders of great lines were not afraid of what may come in the way of hostile legislation. Hundreds of communities need a railway station in order to grow as they should. The Trans-Mississippi country ought to have thousands of miles of new railway in the next year, and the men who are most familiar with its needs and opportunities realize this most completely. It makes no difference whether these new lines are built by old-established railway corporations or by new ones. The railroad to-day is run on principles of straightforward business and all must come under the same regulation. But the thing is that more lines should be built, more country should be opened, more facilities should be given to sections that have thus far exceeded the ability of transportation lines to accommodate their needs.

All this is a part of the work of the Trans-Mississippi Commercial Congress. It is the direct road to prosperity and needs but a greater market in order to allow the Pacific coast opportunity to expand to its full needs. I am convinced that the Reclamation Service is going to transform California. I have visited many of the projects, and their works are marvelous. Already nearly $20,000,000 outlay is planned for the territory immediately tributary to Los Angeles and something like $75,000,000 for the Trans-Mississippi territory.

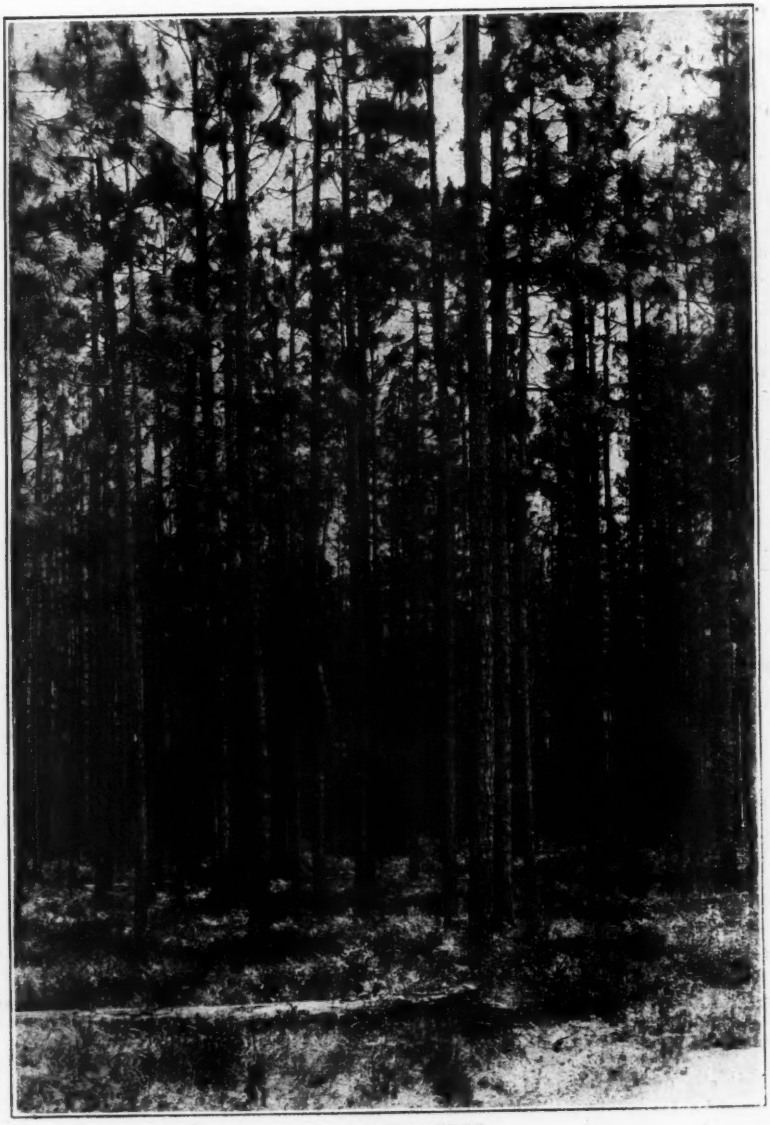
I am in favor of expending $200,000,000, if necessary, in order that every drop of water falling on the western lands may be utilized in increasing fertility. There is but one California, with climate, soil and surroundings that make an ideal spot.

The Western States have developed faster than the transportation facilities and the markets. The population and business have grown more than 100 per cent. in the past fifteen years, while the railway mileage has increased only sixty per cent. Ten thousand miles of new railway track could be used in the next year west of the Mississippi.

We need particularly a South American outlet, and I am endeavoring to secure a national commission of western business men to visit South American countries and interest them in California's fruits and wines and in the products of other Western States. We ought to have all of that trade, especially when the Panama Canal is opened, from both coasts of South America. The proposition is received with approval throughout the West and will come in excellently with the Pan-American Congress which it is proposed to hold in San Francisco two years hence.

Three thousand business men are members of the Trans-Mississippi Congress and their work during the coming year will be in the direction of greater irrigation, reclamation, transportation and trade expansion.

The coming year of the Trans-Mississippi Commercial Congress promises to be a very successful one. A committee has been appointed, consisting of the president ex-president, and members of the executive committee, to call on the incoming President of the United States soon after November 3 and secure a promise that he will attend the session in Denver, August 15, 1909. If successful, it means that the twentieth session will be the largest in the history of the Congress.



IN A SOUTHERN FOREST

A Close Stand, about Forty Years Old, of Southern Yellow Pine, near Savannah, Ga.

CONVENTION OF THE OHIO VALLEY IMPROVEMENT ASSOCIATION

THE Fourteenth Annual Convention of the pioneer association of citizens to promote river improvement was held at Louisville, Ky., October 22-23, in the Seelbach Hotel. The meeting was an enthusiastic one, largely on account of the feeling that the long-awaited fruition of hopes and labors is at hand. The annual report of President Vance, which followed the opening exercises, showed the affairs of the organization to be in a gratifying condition; it and the address of Hon. Joseph E. Ransdell, President of the National Rivers and Harbors Congress, were the features of the morning session. Mr. Ransdell outlined the development of the recent waterway movement, beginning with the organization of the Ohio Valley Improvement Association, and directed attention to the constant aid and encouragement this Association has given other organizations of kindred aim, including the Rivers and Harbors Congress.

The afternoon session was devoted to addresses by Maj. William L. Sibert, U. S. Engineer Corps; Mr. W. K. Kavanaugh, President of the Lakes-to-Gulf Deep Waterway Association; Mr. George W. Theiss, Mr. Alfred K. Nippert, and others; and the evening session to addresses by Hon. F. B. Posey, of Indiana, and Mr. A. B. Lipscomb, with an illustrated lecture on the Locks and Movable Dams of the Ohio River, by Capt. J. Frank Tilley. The session of Friday was occupied by reports of the secretary, Capt. J. F. Ellison, with reports of committees (including that on resolutions), brief addresses giving assurances of support by Representative Swager Sherley, of the Louisville District, and several other members of Congress, with more extended addresses by Hon. Albert Bettinger and Dr. W J McGee; the session closing with the election of officers and selection of Cincinnati as the place for the Fifteenth Annual Convention in 1909. During the afternoon the delegates and guests, through the courtesy of the Louisville Executive Committee, made a trip through the harbor and examined the government work in progress on the movable dam at the Falls of the Ohio.

Mr. Bettinger summarized the legislation, surveys, and other procedure leading to the present plan for improving the navigation of the Ohio by means of a series of fifty-four movable dams, extending from Davis Island to Mound City, designed to give a nine-foot stage, at an aggregate estimated cost of over $63,000,000. Six dams have been completed and eight are under way, of which two will be completed within a year. He also outlined "the new policy of waterway improvement." The Association has contributed much to the creation of sentiment in favor of a departure from the old methods. The evils of indiscriminate approval of projects, insufficient provision of funds to carry them promptly to completion, the lack of a comprehensive plan of river improvement, insufficient number of engineers, have all been so much discussed that a mere mention of them is sufficient. What principles should guide the future action of Congress in these matters? President Roosevelt, in his message to Congress February 26, 1908, transmitting the report of the Inland Waterways Commission said:

> No project should be begun until the funds necessary to complete it promptly are provided, and no plan once under way should be changed except for grave reasons. Work

once begun should be prosecuted steadily and vigorously to completion. We must make sure that projects are not undertaken except for sound business reasons, and that the best modern business methods are applied in executing them. The decision to undertake any project should rest on actual need, ascertained by investigation and judgment of experts, and on its relations to great river systems or to the general plan, and never on mere clamor.

The improvement of our inland waterways can and should be made to pay for itself so far as practicable from the incidental proceeds from water-power and other uses. Navigation should, of course, be free. But the greatest return will come from the increased commerce, growth and prosperity of our people. For this we have already waited too long. Adequate funds should be provided, by bond issue, if necessary, and the work should be delayed no longer.

In his recent address to the Lakes-to-the-Gulf Convention, held in Chicago early this month, Hon. Wm. H. Taft said:

A plan should not be adopted until fully confirmed by expert opinion and careful investigation, but when it is adopted, when its utility is made certain, then it is neither economy to the Government in the matter of expenditure nor is it a benefit to the people to delay the furnishing as rapidly as it can be economically expended of the full amount of money needed to make the improvement a useful and completed thing.

The achievement of these great ends cannot, however, be worked out through Congress without a radical departure from the course of procedure heretofore employed. No projects should be approved without the most careful consideration as to their feasibility and usefulness. When the execution of an approved project has once been determined on, it should be carried to completion as rapidly as possible, so that the people's investment may be made to bring returns at the earliest possible moment.

During my term as Secretary of War, I had occasion to appoint, under the provisions of an act of Congress, a board of engineers to examine and report upon the Ohio River improvements, both upon a six and a nine foot basis, and upon its feasibility and advisability. The board, after a thorough examination, unqualifiedly reported that the improvement be made to a depth of nine feet. One-fifth of the work has been done under previous reports and approvals, but the rate of progress was such that one-half a century would not see its completion.

A policy which brooks such delay is wasteful, if nothing worse.

You will observe, therefore, that measured by all the principles of the new policy, the Ohio River project is ripe for such action by Congress as will provide all the funds necessary for its completion as rapidly as the work can be prosecuted. A stage of nine feet cannot be provided from Pittsburg to Cairo, except by the construction of all the dams. The engineers have stated that all the dams can be put under construction at the same time. The corps of engineers should be increased by additions from civil life, or the whole work placed in the hands of a special commission, in which the corps of engineers shall be represented. The Panama Canal will be completed in 1915. The Ohio River can be completed at the same time. The cry "From Pittsburg to Panama" should become a reality.

The delays thus far may be charged to official waste, but henceforth such delays will be a crime! The work should be completed or abandoned. Congress, in its wisdom, may do either. The latter course would cause such a public uprising in protest as was never heard of before. The commerce of the country is clamoring for more transportation facilities.

Major Sibert indicated the commercial importance of the Ohio if made practically available for navigation, outlined the methods and policies of the corps of engineers, and illustrated the dilatory progress. The lock at Davis Island was finished in 1885; the first appropriation for the second lock built was made in 1902, seventeen years after the completion of the first; while the Isthmian Canal should be completed in less than seven years. He discussed adversely the relations between forests and river improvement, bringing out the well-known fact that flood-heights do not sensibly increase with deforestation, and questioning the feasibility and desirability of flood prevention by means of reservoirs; all under the conventional policy of restricting river improvement to engineering works and ignoring the general control of the water, the regulation of regimen, the adjustment of terminals, etc. After referring favorably to a recent article by Col.

H. M. Chittenden, he urged, with respect to forestation the prevention of erosion and floods, and other features of river control: "Do not permit yourselves to enter into league with any of these generalities; if there is any one element of our natural resources that can wait to be conserved and take no chance of being lessened in quantity or being controlled by a few individuals, it is the water that falls from the heavens."

Dr. McGee emphasized the commercial importance of the great valley drained by the Ohio. Comprising nearly 200,000 square miles in area, with a population considerably above 10,000,000 and a wealth approaching $25,000,000,000, it is comparable with old-world nations, and might form a nation of itself were it not the heart of a greater nation. With a mineral production approaching and an agricultural production exceeding $1,000,000,000 annually, and a manufacturing production approaching $5,000,000,000, it must at present rates pay something like $1,000,000,000 annually in transportation charges to place its productions in the markets of the world; and reckoned on any reasonable basis the excess of this tax over what would be required if the Ohio were navigable readily as the lake route could hardly be less than $100,000 000, certainly not less than the $64,000,000 required for completing the improvement under the approved plans already under way for eighty-four years, and likely to continue at the present rate forty or fifty years longer. In other words, the Ohio Valley loses each year in excessive transportation charges more than the entire cost of improving the river permanently. It is the business of the Inland Waterways Commission, not to take up engineering projects under way, but to ascertain why, after an expenditure of hundreds of millions of dollars in improving the rivers, the boats are not running on them, and then to point out how the waste can be checked. In the case of the Ohio the chief obstacles to navigation have been: (1) commercial, and (2) physical. The leading commercial obstacle has been railway competition, which is now diminishing; the leading physical obstacles arise in the increasing number and duration of floods and low waters resulting from settlement and deforestation, and the concurrently increasing cost of adequate landings and other terminal facilities, though there has been little change in flood-height, since the rise is normally limited by the natural flood-plain. The increase in flood frequency is shown by a table extracted from data collected by Mr. William L. Hall of the United States Forest Service; from which it appears (1) that if the period covered by records on the Ohio and its principal tributaries be divided equally, the number of floods was much greater during the second half of each period than during the first, and that in nearly every case the duration of floods was also

River	First and second period of record	Mean precipitation	Number of floods	Total days	Average days	Flood point	Danger point
		Inches				*Feet*	*Feet*
Ohio, at Wheeling, W. Va.	1882-1894—13 yrs.	38.66	46	143	11.00	22	36
	1895-1907—13 yrs.	38.03	59	188	14.40		
Monongahela, at Lock No. 4, Pa.	1886-1896—11 yrs.	39.76	30	55	5.00	20	28
	1897-1907—11 yrs.	39.27	52	100	9.09		
Cumberland, at Burnside, Ky.	1890-1898—9 yrs.	46.27	32	89	9.90	25	50
	1899-1907—9 yrs.	41.42	43	102	11.33		
Allegheny, at Freeport, Pa.	1874-1890—17 yrs.	40.13	39	92	5.41	16	20
	1891-1907—17 yrs.	35.28	53	131	7.70		
Tennessee, at Chattanooga, Tenn.	1875-1890—17 yrs.	52.10	32	164	9.65	24	27
	1891-1907—17 yrs.	45.01	33	143	8.41		
Muskingum, at Zanesville, Ohio.	1887-1897—10 yrs.	36.87	17	73	7.30	15	25
	1898-1907—10 yrs.	35.17	41	171	17.10		
Numerical average difference		3.27	14	36.5	3.30	..	..

greater during the later half; and (2) that in every case the precipitation within the drainage basin was less—in several cases materially less—during the later half of the period. The number of low waters, and the duration of the low-water periods were augmented in even more notable degree during the later subperiods, though the records are less complete. In all cases the change accompanied extensive deforestation. Were the preparation of a plan of improving the Ohio under the new policy adopted by the President and Secretary of War now in question, it is probable that a preference would be given to a system of fixed dams and locks, since such a system would tend toward a more complete control of the water, and hence toward counteracting the steady growth of the physical obstacles to navigation; but the question of plan has been settled—a good enough plan has been adopted, and the only sane course is to carry out that plan vigorously, promptly, and effectively. Meantime, the efficient scientific bureaus in the Departments of the Interior and Agriculture may safely be trusted to devise and put in execution those nonengineering plans required to control and retain the water in such manner as to prevent floods, keep the channels clear of sediment, and insure a sufficient volume of water to meet the needs of navigation even during extraordinarily dry seasons.

For the ensuing year nearly all the old officers were reelected, including Col. John L. Vance, of Columbus, as president, and Capt. J. F. Ellison of Cincinnati, as secretary and treasurer.

HIGH WATER ON THE OHIO RIVER

Car Tracks, Railroad Yards, and Warehouses Flooded in One of the Manufacturing Cities of the Upper Ohio Valley

DROUGHTS AND FLOODS

By JOHN H. FINNEY, Secretary of The Appalachian National Forest Association

NO SEER, looking ahead a decade and prophesying concerning the future of America without its forests, could well have drawn a more vivid imaginative picture of conditions than the actual recital in the daily press in the past few weeks of forest fires throughout the country and of droughts in Pennsylvania, Ohio West Virginia, etc., setting forth the tremendous money damage, the loss of life; the paralysis of business, the serious menace to the health of the people caused by them; where the supply of water was so short that it became a more profitable crop than produce; when baseball was being played in what was the bed of the Ohio River; where dried-up streams had become vast open sewers and were being sprinkled with lime to prevent an epidemic of disease; where prayers were being daily offered for rain!

These conditions, due to a shortage of water, appalling though they be, tell but a part of the forest story; the other part is told by the disastrous flood conditions which the South was experiencing at the same time; a story that has to do with too much water, but told to the same accompaniment of loss in money and human lives.

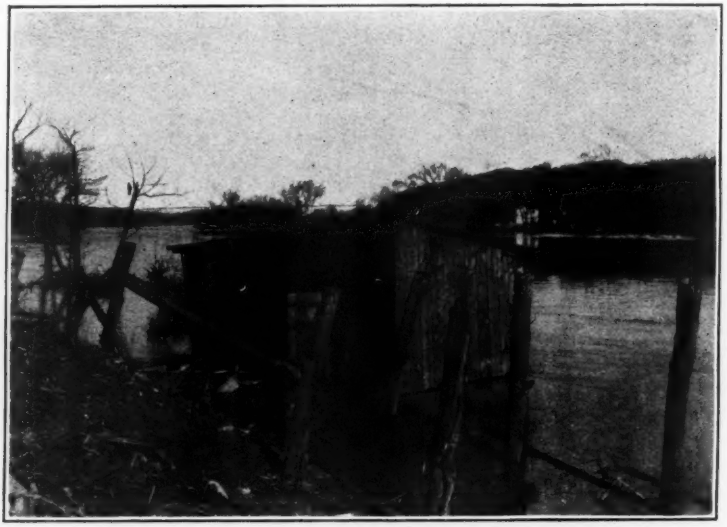
Surely, if a forest preservation lesson is needed to make us heed the conditions which our present policy means to future America, these occurrences under our own eyes and touching the material welfare of our own neighbors and friends ought to be realistic enough to drive the lesson deep into our hearts and consciences.

A FLOODED CITY

Scene on River Avenue, Pittsburg, During an Inundation. Floods at One Season, Droughts at Another, because the Forests Are Gone

That both sides of the story are due to our recklessness of cutting and waste of the forests can hardly be questioned by thinking men.

The recent southern flood in August and September covered a wide area in North Carolina, South Carolina, and Georgia, the principal damage being done along the Cape Fear, the Yadkin, the Catawba, the Broad, and the Savannah rivers and their tributaries. The damage done to crops and low grounds, by washouts of roadways, and railroad rights of way, railroad bridges, county bridges, and by losses in the various cities affected is not short of $25,000,000, with a lamentable loss of nearly a hundred human lives.



IN A FLOOD-SWEPT REGION

House Washed Down the River by High Water, During a Flood in Allegheny County, Pennsylvania

The worst flood in the history of the Savannah River overwhelmed Augusta in the early morning hours of August 26th, the high-water record of the worst previous flood, that of 1888, being exceeded by two feet before midnight of the 26th, at which time the height of the water over the street-car tracks on the principal thoroughfare, beautiful Broad Street, was two feet, running from six to eight miles an hour, and lasting for a period of forty-eight hours, the flood covering an area from east to west of five miles from North Augusta Highlands to a point beyond Horse Creek.

With all communication with the outside world practically cut off—wires down, no street-car service, no electric or gas lights, without fire protection, and short of water, except the twenty-five miles of red and raging torrents that swept over her and submerged her to the farthest foothills; with hundreds of people homeless; business and traffic entirely suspended, is it necessary to go into further details to bring the horrors of the scene more closely home to you?

Augusta's experience is in part duplicated in Columbia, S. C., and other less important points in the section affected, and along all the streams are striking evidences of the power of the unrestrained and angry waters that will take many months and many millions to restore to normal condition.

There should be no story without a moral. This one carries a striking one

in the conclusion that the forest covering is needed and must be had. A glance at the map will show at once that all the streams named have their headwaters in the Southern Appalachians and are necessarily affected by the destruction of the forest in that region. How strikingly true this is can be best shown by the statements recently made by City Engineer Twiggs, of Augusta, that "The power canals in Augusta have filled up from silt more in the past eighteen months than in thirteen years previously;" the character of the silt showing clearly its mountain origin. And this is borne out by the testimony of A. M. Schoen, Chief Engineer of the Southeastern Underwriter's Association, in his report on the Augusta flood in the following impressive warning: "Furthermore, there is reason to believe that heavy freshets in rivers taking their rise in the Southern Appalachians are to be anticipated more frequently in the future than in the past, owing to the rapid cutting away of the timber on the watersheds comprising the drainage basins of these streams, which means an increasing probability of such occurrences as that which overwhelmed Augusta."

Wherein lies common sense regarding this whole matter? Is it not along the line of the immediate establishment of the Appalachian-White Mountain National Forest, and the adoption of a definite forest policy by the National government covering the whole country, as the first step, and does it not point out the work that the states themselves must do within their own borders and with their own citizens toward a rational policy of perpetuation of their own forests—a policy that can be carried out only by themselves?

If the lesson is learned and heeded, we should have, as promptly as Congress can pass the bill, the Appalachians, and a State Forest in every Southern state that will in time insure them against such damage as is herein chronicled.

ONE OF PENNSYLVANIA'S PERIODICAL FLOODS

Wreckage of a Steel Bridge, on the Pennsylvania Railroad, Crossing Deer Creek, in Allegheny County
Three Lives Were Lost in the Wreck, besides a Locomotive and Five Cars

A BEGINNER IN FORESTRY

By ANNE WARNER

Paper Two

I BEGIN to wonder if, in the caring for trees so that they may produce railroad ties, houses, and other truly artificial necessaries, we haven't lost sight of the whole basic principle of Forestry. The real need of trees is so that weary mortals may get out of houses and off of railroad ties, and back to one of the greatest pleasures of life—the pleasure of just being alive—the pleasure of becoming a child in heart—the pleasure of being happy without knowing why.

The place where I am is small, not much frequented, totally ignored by Herr Baedecker, and the most of the inhabitants of the village are the simplest peasant folk, men and women who work in the fields and go home at night in long, uneven ranks, seven or eight together, each carrying his or her rake, hoe, or shovel. There is a domain, or large landed estate, and the woods belonging to the estate come as strictly under the forester's rule as if they were government property. The whole countryside is covered with beautiful forests—mainly "self-planted." The forester has explained to me that, when there is a good growth of young trees after the cut, they let them alone, only concerning themselves with the thin places or the places where the soil is evidently not fitted for the young trees springing there. The soil in this vicinity is chalky and the lay of the land makes me want to study geology—when I don't want to study mushrooms, botany, astronomy, or any other one of the new-old primitive sciences which press powerfully to the fore when one comes under the forest's scepter.

The desire to know the answer to the riddle is that the riddle here is so big. The great plain of Northern Germany lies straight outspread beyond me as I write. Wide and flat, dotted with villages, fertile, with rich upper soil. The ocean once rolled to the foot of this hillside, and, ages earlier, all the rocks of which the hill and all those around are made, was formed in its depths. Now, this is the riddle: All the rocks are strata, plainly defined, and without exception they are all tipped almost perpendicularly on end. The slant is invariable, and the ends of the strata have a sharp little twist just beneath the soil. The soil on these rocks is only one or two feet deep and is first sand and then the rich black of vegetation. Such a big riddle to me.

The foresters interest me greatly. Men who care for the growth of 150 years and who cherish the life in that which will come to its end in 2050 or thereabouts, must have some traits which any American may well find interest in studying. The forester here tells me that he loves his vocation and I can understand that no man would choose it who did not love it, because of all vocations it would be the least possible to give a living to an indifferent follower. I went with him the other day to see his knife mark out the superfluous saplings and I soon learned the two rules that saved or condemned: health at the root, and whether or not the young top formed part of the cover overhead. The cover overhead must be continuous or else grass grows beneath, and grass is not allowed in German forests. I mean, of course, as a general thing—there are large open

spaces every little way, places where the sun streams in and illuminates the whole scene with a radiant, heavenly glory, that makes the legend of St. Hubert most easily believed.

I spoke once of the exquisite "order" of the German woods, and I must speak of that again. As I said before, this is no frequented resort, no show-place, and yet the woods-paths, the little bridges, the tiny stone culverts, the wide, even macadamized roads for wood transport—everything is in what we might call "most beautiful order." The dead branches and twigs belong to the poor to gather for the first two days after storm or wind. We see them coming home—old men and women—their loads bound on their shoulders—just as they have come for thousands of years. They go quietly by piles of neatly stacked cut-wood to be taken to town and sold when the men shall have time, and the cut-wood remains undisturbed until that time. The absolute sturdy honor and honesty of the poor man in Europe is quite as much to each nation's credit as the care they give to their trees. To my eyes it links somehow to the spirit that leads the market women to leave her full basket outside the church door and go in to pray. We shall come to that spirit in future centuries; we laugh at it now because it is as easy to laugh as it is to give the California trees over to the executioner—but—a long way ahead—we shall not laugh. We shall pray, too, in that day—we shall give cast off wood to the poor, instead of heaping it together to burn forthwith; we shall have a reverence for what has grown old in service, and we shall be as willing to furnish schools for our trees as for our children. Some few out of each thousand know now how close is the unseen bond between the trees that we are trying to guard and those same children. It is closer yet between the trees and those children's children. And between our trees of to-day and the third generation hence it may well be vital.

One little word more and then I shall have filled my space and must end. I want to tell of a curious way, the like of which I never saw before.

For about a quarter of a mile along the highway there runs on one side a wide strip of land laid off in rows of parallel trees (parallel with the road) planted about ten feet apart, but with deep hollows running lengthwise between. The trees have had their tops cut in the old French fashion until the new sprouts form a thick cover overhead, the whole too low to walk upright through. I was very curious about this way and could not think by whom or for what purpose it could possibly have been made.

So I asked the forester, and he told me that the way used to stretch around the angle and down the hillside to the manor-house barns, and that it was planted centuries since and kept filled in as the old trees died, so as to provide a covered shelter for the herds and flocks which were driven daily through the wood and out to the pasture land on the other side. The herds and flocks are not so plenty now, and the way itself has been curtailed, but when it rains we go in under its close green shelter and—like many moderns who think the sun takes a year to go carefully and kindly around our little earth—thank the old Lords of the Manor for having thoughtfully saved us a wetting.

I hope next time to write something of the old forest history of Germany—something of the days when the kaisers or koenigs gladly gave forests away if the receiver would just kindly measure them and save the crown the trouble of working out the problem of its own generosity.

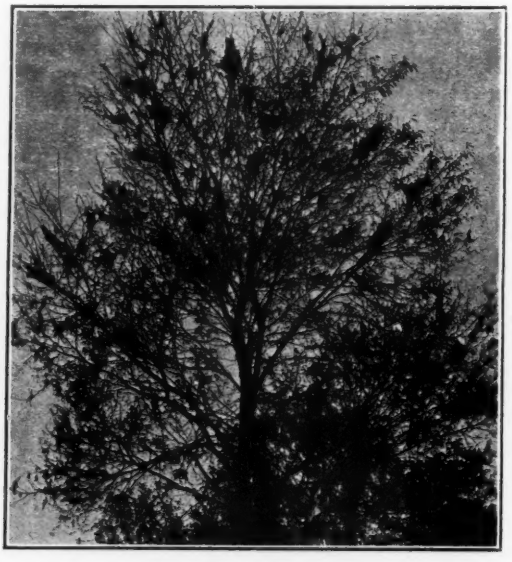
COMMUNICATIONS

THE FALL WEB-WORM

EDITOR CONSERVATION:

We have heard much concerning the gipsy moth and brown-tail moth of the East, but this pest, the "fall web-worm," shown in the accompanying photograph, is so familiar to our gaze that we see no more harm in them than in the English sparrow. In many parts of New York State, the upper portion of Pennsylvania, and all the upper half of Ohio the trees are covered with them. They are seen on the rose bushes and shrubs of almost every lawn and dooryard. The cemeteries have them, and the woodlands are becoming devastated by them. In five years they have increased a thousand to one; increasing by geometrical progression—in fifteen years—there cannot be a living tree in the regions named nor in many other portions of the country. The average tree will die after five consecutive years of defoliation. Alarmed at their increase, and at the lack of attention to their ravages, the writer has made the pest a special study during this last season.

They follow in the wake of the English sparrow, and are most numerous where there are the least trees. On the way to Alabama, in August, the writer found that they disappeared just above Dayton, Ohio, and there were but few through Kentucky and Tennessee; but the writer met a gentleman in Huntsville, Ala., who said they were quite numerous down the eastern coast line, clear to Florida.



NESTS OF THE FALL WEB-WORM

The reason why people are not more concerned over the ravages of this caterpillar is, presumably, that it is considered a local pest; but it will soon be

a national one, and spraying is entirely out of the question. How could hundreds of thousands of acres of forest be sprayed? And if they could, only a part of the worms would be destroyed.

The restoration of our birds is our only hope. It is significant that these worms' nests are most numerous nearest the human abode. There are reasons for this; our songsters, the small insectivorous birds, are buffeted and driven away by that foreign vagabond, the English house-sparrow; and should a bluebird, oriole, or wren succeed in hatching a brood near a human habitation, the little fledgling usually drops to the ground, in its first effort at flight, and is grabbed by a cat. The Audubonists have ascertained that there are some 50,000,000 cats in the country, and that they destroy, on an average, fifty young birds each, or 2,500,000,000 useful birds annually! The crows are multiplying at an enormous rate of speed, and they do little else in the nesting season than to rob small birds' nests to feed to their own young. The young bird is a dainty bit for the snake, and the hawk has a piercing eye. Our valuable birds are disappearing at the rate of at least ten per cent. annually.

Good people of America, something must be done at once to restore the birds. A paper is prepared, summarizing the food habits of our small birds, accompanied by a petition blank for their restoration.

We ask that every reader of CONSERVATION send for the pamphlets and commence work at once. Take them to your clubs; put them into the hands of school teachers. Full instructions are given.

Please remember it "takes money" to do printing, and we ask you to enclose a stamp to pay postage.

Address, John Davey, Kent, Ohio.

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Two Essays

EDITOR CONSERVATION:

The enclosed article, the valedictory address of Miss Ellen M. Hastings, of Elk River, Minn., High School, is to my mind a unique piece of forestry literature, not so much because of any new information which it contains, but from the novelty of its source and its fresh, wholehearted and concise treatment of a broad national topic. It seems to me that we can ill afford to let the spirit of young America therein displayed go unnoticed, since that is the spirit and generation whose interest and support we want to enlist to carry forward the movement for the conservative use of our natural resources. I venture to say that that address, linked as it was with the personal interest of every member of the audience in the speaker, and borne to them in the spirit of such an occasion as that, was a factor of more potentiality for lasting impressions than a score of similar addresses delivered by the most enlightened propagandist. The author is not personally known to me, but I am nevertheless interested to see all such endeavors encouraged.

LOUIS S. MURPHY.

Thompson, Mont.

MISS HASTINGS' VALEDICTORY ESSAY

The forests; what do they mean to us? Do they not embody strength, beauty, protection, inspiration? What would our environment here be without the woods? A desolate prairie, bleak in winter, and dazzling and torrid in summer. Would we be content to see our oaks gradually disappear, until we might look across an interminable space, with only the frail habitations of mankind to obstruct our view? No; a thousand times no! If we, a very small part of the whole, can begin to realize the importance of the preservation of forests, how much more ought our great, progressive, and far-seeing nation to realize the momentous value of the advancement of forestry.

When the early colonist settled along our eastern coast he found it covered with forests. These furnished him lumber for his home, and fuel. His old respect, matured in the old world, was fostered. From a friend the forest soon changed to an enemy. Did it not shelter his deadly enemies, the Indians and wild beasts? Did it not prevent the pursuit of agriculture? Naturally he assumed the attitude that the forests must be destroyed if civilization was to advance.

As his descendants moved westward they continued to meet and to destroy the dense forests, maintaining, long after there was the faintest cause, the attitude rightfully assumed by the first settler.

Before this destruction was begun the forests covered all this country except the plains west of the Mississippi. East of the Mississippi were the white and southern pine, which have supplied the generations with lumber; the hardwood forests of oak, ash, hickory, and gum. West of the Mississippi and the plains were the Rocky Mountain evergreen forests and the Pacific coast forests of redwood and firs. These were probably the richest forests in the world. Not only did they represent a vast, untold wealth in lumber, but they also had a direct and tremendous effect upon the productivity of the land.

The roots of the forest form a great sponge which, as a natural reservoir, holds the water at the earth's surface. Where water for irrigation is the "life blood" of a community, the first and greatest necessity is a forest at the source of the streams.

The forests also have a great influence over the climate. It has been proven by many observations that the temperature within the forest in the winter is several degrees higher than in the open, and in the summer is several degrees lower. This moderation is due to the moisture of the forest cover.

Besides these inestimable effects upon the vital interests of the entire country there are the local uses. In the mountains the forests are safeguards against snow slides and floods. On the open prairies or by the sea they afford protection against winds and storms.

Seemingly unconscious of the future and with the same idea of our ancestors, we are still destroying in hours what it will take centuries to produce.

What has been done with this mass of wealth and power? The greater part of it has been used in supplying the ever-increasing demands of our growing nation. Although concrete and metal have replaced lumber in some ways, it is still an undisputable fact that they have not reduced the demand for hardwood. While they are finding substitutes for wood in construction, they are also substituting it for other functions. Recently great areas of spruce timber have been purchased by pulp and paper manufacturers. Already the pulp mills are meeting a very large part of the paper demands of this country.

Every year large tracts of splendid forests have also been criminally destroyed. This devastation has been carried on by forest fires. In the early years this method of destruction was encouraged because of its rapid and thorough results. Now, although the United States Government is taking every precaution against these fires, men called "timber pirates" succeed in burning large areas in order to obtain the "dead and down" timber. Had the destruction of this vast wilderness of trees affected only the lumber resources of the nation the result would have been sufficiently appalling. The destroying of the forests, has, in many cases, caused the disappearance of rivers and streams which had their headwaters in the forest reservoir. Even now, while representatives from the valley of our "Father of Waters" are knocking at the doors of Congress for a one hundred million dollar appropriation to deepen the channels of this great river for a navigable highway, we can hear the echoes of the axes and the crash of the quivering giants as they fall to the ground. *Fell the forests, dry up the reservoirs of the river's headwaters, then ask for one hundred million dollars to deepen its channel!*

The same source accounts for change in climate from moderation to extremes, and for the increase of destructive storms and floods.

If this reckless destruction continues, how are we going to maintain waterways or check floods? Where are we going to obtain lumber and fuel for the innumerable demands? Surely we do not expect to devise substitutes for all its natural resources or to import it for its artificial uses. Yet if this devastation goes on as at present, within a short time we will be entirely without the most useful servant to man, except the earth itself.

With these facts facing us, the broad-minded men of this nation are awakening to the realization of the tremendous significance of forestry. They are considering it as the greatest problem with which our nation has to deal.

What can we do? Preserve the remaining forest. Make it the obligation of every owner of a woodlot that he shall protect it. Let him use the accumulating interest and leave the principal untouched.

Agitate the question of national and state reserves. Let the Government guarantee the best care and protection for them. Further than this, let the Government reserve tracts of land suitable for new forests.

Instruct the legislators to see that more stringent laws concerning the growing and cutting of timber be passed and more strictly enforced.

But more important than all this should be the founding of good forestry schools. More bright and capable young men should be made interested enough in forestry to make it their profession. To draw their attention, the schools should be made popular and attractive.

If once our young men became enthusiasts, their enthusiasm will arouse the nation. Forests will be produced, preserved, and protected. Once more we will live in closer communion with nature.

* * *

EDITOR CONSERVATION:

I have been away from our home in Cartersville, Ga., since June, but have only had my interest in our forests strengthened by the awful fires which

obscured the sunlight from Maine to Philadelphia.

During my stay in Philadelphia, my native place, I found the enclosed composition, written by a young nephew. I am sending it for you to read, because it seemed to me to contain quite a good synopsis of the reasons why our schoolchildren should be persuaded to become friends of the forests.

CAROLINE D. G. GRANGER.

New York City.

OUR FORESTS—A NATIONAL NECESSITY

In America, as in other countries before it, the first settlers found it necessary to hew down certain portions of the forest in order to make clearings in which to build their houses and plant their corn. Moreover it was necessary to push farther from their dwellings such forests as sheltered wild beasts and savages. Subsequently, as the population grew, the trees were cut down for purely commercial purposes, namely, for the selling of wood for building lumber, pulp, turpentine, and other uses. The continuance of this unrestricted cutting down of trees for centuries without any replanting of young trees, has resulted throughout the larger part of the eastern United States in the partial destruction of the forests, while in some places they have been completely destroyed.

Some states, notably New York, saw the peril of this practice in time and guarded against it by careful restrictions and by the state buying up tracts of forest in which the streams took their rise. Other countries learned the lesson too late. France has had to spend forty millions of dollars in endeavoring to restore lost soil and forest to her mountains after a long course of destruction, such as is now going on in America. The countries which have taken steps to preserve their wood supply, are found to be those which at the present day are most prosperous, and have the best prospects for the future.

The need of wood for some purposes has been lessoned; coal, for instance, has been largely substituted for wood as fuel, and many other manufactured things have taken its place for building purposes; but in spite of this, there is more wood used to-day than ever before.

Forest land acts as a vast reservoir, for the earth is naturally soft and easily absorbs the rain, which, on account of the cover of dead leaves and the shade afforded by the trees, is not evaporated by the sun, but is stored up in innumerable springs and in many small lakes or ponds.

From many such reservoirs, large and small, are fed the streams which flow down to the lower lying farm lands and make our larger rivers navigable. By this natural method there is a constant supply of water throughout the year; whereas when the land is denuded of forests the rainfall and melting snow flow at once into the streams, transforming them into raging torrents, although during the larger part of the year the stream may not contain water enough to make the land fertile. Thus it happens that where there are no natural reservoirs of water in the forests, artificial reservoirs have to be built, and an expensive system of irrigation carried out. Moreover, both the natural and the artificial reservoirs guard against floods, which wash off the loose earth from the mountainsides and carry it to the mouths of rivers, where it is deposited, and from which it must be dug at an outlay of an enormous amount of money.

When the forests fail, the rivers will dry up, for without them there will be nothing to keep the water from running right off. In some rivers already the water for most of the time is not deep enough, but in the spring the streams overflow their banks and cause terrible damage. The floods on our own Mississippi show us what the ruthless destruction of our timber about its headwaters is accomplishing.

When the forests are gone the country becomes uninhabitable. For this reason Tyre and Sidon, Babylon and Antioch came to ruin. One third of China has become unfit for habitation through destruction of the forests, for when they are destroyed the soil soon becomes so poor that it will not support a large population. The country is astounded at a great disaster like that at San Francisco. The people respond willingly, and millions of dollars are immediately given for its aid. Yet we are told that a city like San Francisco might be destroyed every three or four months without causing greater loss of national wealth than is now going on all the time.

The pinch is being felt already, for with the decrease in the supply of hardwood, industries, such as carriage building and furniture making, will be wiped out. The decline in the wood-working industries of Ohio between 1900 and 1905 was more than fifty-seven per cent. In Indiana the timber-using industry fell from the third to the eighth place. In 1905 the furniture establishments in the United States reported the annual use of 580,000,000 feet of lumber, and without hardwood lumber they are helpless. Yet the present supply, which is for the most part in the highlands of the East, will be exhausted in fifteen years. Building materials also have become more expensive, and hence the rents go higher.

Farming also suffers. Thousands of acres once cleared land have been abandoned, and in the South the farms are moving farther and farther up the mountainsides, with only a brief space between the beginning and the end of their usefulness.

Commercially, as a public asset, from the tourists' viewpoint alone, the White Moun-

tains are worth $8,000,000 a year. Such famous places as Crawford Notch are rapidly being made hideous by the cutting away of the forests.

It is a pleasure to see that the Senate has recently passed a bill appropriating $5,000,000 for beginning the purchase of lands in the Southern Appalachian and White Mountains.

Our trees must be considered as a crop which needs to be replanted if we would have it continually, and not as something which we may forever cut down and never exhaust. We must face the fact that without forests we can have neither fertile soil nor navigable rivers, and hence without forests we shall become an impoverished nation.

HENRY GREGORY ALLYN.

May 17, 1908.

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Eucalyptus Growing

EDITOR CONSERVATION:

I spent most of last winter in southern California, and devoted a large part of the time to a study of the eucalyptus. I found, as claimed by growers, 100 or more species and distinct varieties, nearly all of which are grown successfully where they can get a supply of soil moisture sufficient to produce farm crops, and where the temperature does not fall more than three degrees to six degrees below freezing. They are grown extensively for fuel, wind breaks, street shade and ornamental trees, and are now being largely planted for railroad ties, telegraph poles, lumber, and many other uses. But experience, as it appears, has not yet fully established the value of the different species for the various purposes, and there is a considerable diversity of opinion as to their relative merits. There are many species of very rapid growth, making annually from three to six times as much wood as the best of our eastern forest and ornamental trees, and while it is doubtful if the enormous profits claimed by some promoters will ever be realized, I believe that as a business, whenever soil and climate are suitable, the growing of eucalyptus will be reasonably profitable. It may be profitably grown on all suitable lands that would otherwise remain unoccupied, and every landowner and homemaker should plant more or less for shade and ornament, wind breaks, fencing, fuel, and various other uses for which trees and their products are always in demand.

S. T. KILSEY.

Las Cruces, N. Mex.

EDITORIAL

The Forest Fires

ALMOST without interruption the reports of forest fires continue to occupy the columns of the daily newspapers. When the final reports for the year 1908 are received and the figures tabulated, it will be found that never in the nation's history have forest fires been so numerous, or their consequences so disastrous as in the year now drawing to a close. No sooner have the fires died out in one region than they have sprung up in another. The fires in the far West and Northwest are extinguished and immediately we read reports of forest conflagrations farther east. The ravaging flames in Minnesota, Wisconsin and Michigan burn themselves out and Maine takes up the story. Back again to the Adirondacks and the White Mountains; then the telegraph tells us of the wasting of Pennsylvania's scanty forests, and before the smoke has pased away, the scene shifts again to Michigan. Maryland and New Jersey also suffer, and the National Capital itself is shrouded in a pall of smoke from burning forests within fifty miles of the Washington Monument.

Thirty Years' Fire Damage

WITHIN the last thirty years, and not including the fatalities for 1908, 1,956 people have perished in forest fires or fires caused by burning forests. Up to the time of writing, the death list for 1908 totals 296, as reported by the newspapers, or about seventy-two human lives per year lost in the flames of burning forests and the conflagrations arising from them.

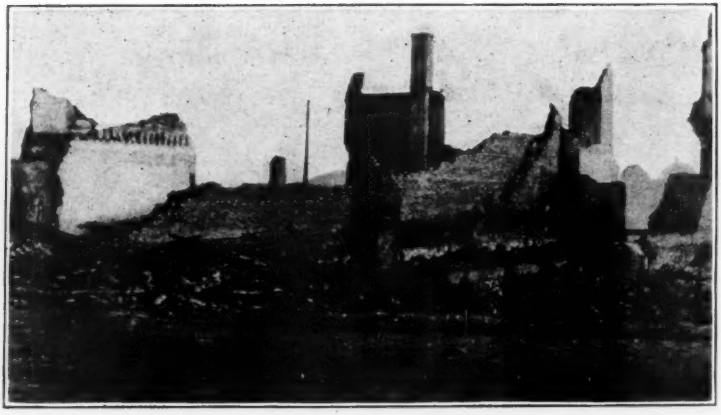
In 1891 the Division of Forestry collected authentic records of 12,000,000 acres burned over in a single year. The value of the timber destroyed that year was estimated at $50,000,000. The official census of 1880 estimated the area burned per year as 10,000,000 acres. While now the acreage of forest burned over every year is undoubtedly smaller, the loss is not decreased, but is even greater, because the value of stumpage has increased since 1880 at least five times, and it is, therefore, only necessary to burn 2,000,000 acres annually to cause the same amount of loss.

Estimate Not Excessive

CITING a few examples of individual fires, it will be seen that the Census Bureau and Forest Service estimates of fire loss are not at all exaggerated. For instance, in 1894, the Hinckley fire in Minnesota burned over an area of 250 square miles, killed 418 people, and destroyed $750 000 worth of property, this being entirely apart from the vast amount of timber and lumber that was burned. In 1902 a fire on the dividing line between Washington and Oregon destroyed property amounting in value to $12,000,000.

During the whole of the month of September, this year, forest fires raged in northeastern Minnesota. The towns of Hibbing and Chisholm, which were in the paths of these fires, were practically wiped out, and the total loss, as conservatively figured, amounted to nearly $10 000,000. The town of Chisholm alone suffered a loss to property, stocks of merchandise, and other items of direct loss, amounting to about $1,500,000.

The fires that are raging in northern Michigan at this writing have already caused losses estimated at anywhere from $1,500 000 to $3,000,000, according to the newspaper reports. One of the appalling features of this great Michigan fire was the derailment and destruction of a train loaded with fugitives from the fire districts. The train, speeding over a track hemmed in on



AMONG THE RUINS, CHISHOLM, MINN.

either side by blazing forests, was thrown from the rails, and with no means of escape possible, the fugitives, penned in the cars, were slowly roasted to death. Press dispatches gave the number burned in this wreck and fire as forty-five to fifty men, women and children. It is certain that very few escaped from the doomed train.

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Other Features of Loss

THE above are the salient, glaring points in the story of this year's forest fires. There are other points, however, that cannot be ignored—other items of loss that figured in the grand total of the Nation's bill for forest conflagrations. The loss to new forest growth alone, conservatively estimated, amounts annually to $90,000,000. If it were not for these forest fires, we might expect an additional growth of twenty cubic feet per acre per year. This, for a forest area of 500,000,000 acres, would amount annually to 10,000,000 cubic feet. Ten billion cubic feet is equal to 45 000,000,000 feet board measure, or more than the present annual consumption of saw timber in the United States; and figured at $2 per thousand this amounts to $90,000,000.

ANOTHER VIEW IN CHISHOLM, AFTER THE FIRE

Other items of loss which cannot be estimated in any manner are those of loss of soil fertility where the humus and top soil is burned and calcined to a depth of from a few inches to two or three feet, and where all soil nutriment is absolutely destroyed; damage to river courses and to farming land adjacent to burned-over forests, such loss arising from floods and droughts which are caused by the destruction of forest cover and which annually cost the Nation many millions of dollars; and the constant depreciation in forest wealth and land values which have destroyed and are destroying the prosperity of many sections, and which form a material hindrance to business enterprises and industrial development.

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Fire Losses of 1907

THE final statistics of fire loss for the year 1907 for national forests having a total area of about 150,000,000 acres show that last year was an unusually favorable one so far as concerned forest fires. Heavy rains in all parts of the country kept down the fires and made conditions such as to be very unfavorable for the starting of any material conflagration. Following is a statement compiled by Mr. E. A. Ziegler, of the Forest Service, covering the fires of 1907.

STATEMENT OF FIRE LOSSES FOR 1907

Showing Lost of Fire-fighting on National Forests

1. **Total area burned over**		212,850[1] acres or .14 per cent. of 150 million acres reporting
2. **Timbered area burned over**		29,365[2] acres
3. **Amount of timber destroyed**		31,026,000 board feet
(or less than .007 per cent. of the 450 billion B.M. estimated stand on this area)		
4. **Value of timber destroyed**		$31,590
5. **Cost of fire fighting** (exclusive of forest officers' salaries):		
Labor	$4,259	
Supplies	718	
Total	4,977	
6. **Total number of fires reported:**		
Class A	845	
Class B	280	
Class C	181	
Unclassified	49	
Total	1,355	
7. **Cause of fires:**		
		Number
Campers		346
Railroad locomotives		273
Lightning		176
Donkey engines		65
Clearing land		34
Incendiary		19
Hunters		9
Herders		6
Miscellaneous		60
Unknown or not reported		367
Total		1,355

[1] Large area burned over due to including three large grass fires on—

Dismal River (Nebr.) National Forest	Area burned, acres	51,200
Garden City (Kans.) National Forest	do	38,400
Wichita (Okla.) National Forest	do	13,840
Total		103,440

[2] Includes area of 11,500 acres in Chiricahua National Forest, Arizona, reported as timberland, but only 100 board feet per acre were destroyed.

Note.—Comparatively few reports contained the month of occurrence, hence distribution statement is omitted.

AT THE CHISHOLM FIRE

After It Was Too Late to Accomplish Anything, a Few of the Citizens Made an Effort to Fight the Fire with a Water-cart and a Two-inch Hose

It will be noted that fire reports were received on 150,000,000 acres in 1907 against 97,000,000 in 1906. The increase is accounted for by the addition of 53,000,000 acres to the total area of national forests in the year 1906. The 1907 figures are further misleading in that they show the burning over of 212,850 acres by "forest fires," whereas, in this acreage are included three fires on grass lands on the Dismal River Forest in Nebraska, the Garden City Forest in Kansas, and the Wichita Forest in Oklahoma. After eliminating these fires, which were confined altogether to grass-covered areas of an aggregate of 103,440 acres, it will be seen that the actual acreage of average forest land burned over was only 109,410 acres. It will be seen thus that the forest land burned over in 1907 was over 400,000 acres less in area than in 1906, although, meanwhile the national forest area had been increased by 53,000,000 acres.

By its system of fire patrol, the Forest Service has reduced the burned-over area on national forests from sixty-six one-hundredths of one per cent. in 1904, to sixteen one-hundredths of one per cent. in 1905, then to twelve one-hundreths of one per cent. in 1906, and to seven one-hundredths of one per cent. in 1907. Upon the basis of the Forest Service's experience on national forests on which the total administration cost per acre, including fire patrol, amounts to only 1 cent, the forest area of the entire United States could be patrolled and protected from fire at a total cost of less than $3,000,000. This would save an annual loss on timber alone of close to $20,000,000 per year, to say nothing of the prevention of loss and damage of all other kinds caused directly by forest fires.

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Fire Protection a Business Proposition

NO TOWN, city or municipality in the United States is without more or less adequate fire protection. The apparatus for urban fire protection may be limited; it may be more or less obsolete—frequently it is—but the protection exists, and in case of emergency it is at hand for subduing or helping to subdue fires that threaten our towns and cities. The entire business district of a city the size of Indianapolis could be destroyed by fire without causing half the loss that is annually caused by for-

ON THE OUTSKIRTS OF CHISHLOM, AFTER THE FIRE

est fires; yet the states go on year after year without fire protection for their timber lands, and without taking any steps toward providing such protection. The State Forestry Board of Minnesota now has just $11,500 per year to spend for protection against forest fires. If the fires at Hibbing and Chisholm alone caused a loss of only $5,000,000, that amount at five per cent. would yield $250,000 per year; and $250,000 a year would be a fund sufficiently large

SPARED BY THE FLAMES

Two Churches and the $125,000 High School Building Were Untouched in the Chisholm Fire

to provide thoroughly adequate fire patrol and fire protection for half a dozen states the size of Minnesota. If our American legislators in reality possessed the business instincts that they are so fond of boasting about, it would not be five years until every state having any amount of timber lands would provide for the safe-guarding against fire of such timber lands. This is a simple business proposition—a proposition to invest, say, forty or fifty thousand dollars a year, to guard against losses that may run far into the millions. How long will it be until American business sense will recognize the business necessity of taking hold of questions like this in a businesslike manner, and take steps to provide the same measure of protection for our increasingly valuable timber lands that they have already provided for towns and cities?

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The Hydro-electric-power Interests

A PHASE of the development of the West that has occupied rather a prominent place in the attention of the public during recent years, is that of the exploitation and development of water-powers for the generation of electric power; and friction between the Government, as represented by the Forest Service, and the electric power concerns has been more or less frequent. There are now pending several cases of alleged fraudulent entries covering valuable water-powers, and one of the largest of the electric power concerns is charged with being directly responsible for a large number of these fraudulent claims. It is charged that this company, which is said to be an auxiliary of the largest electric power and manufacturing concern in the country, has secured possession of water-powers by the expedient of having stenographers in the employ of the company make dummy entries; and the statement is also made that in at least two or three instances the consent of such dummy entrymen has not even been secured, and they have not known that their names were being used until they were notified of the fact by Government officials.

Now, the day for bald pilfering of this sort has passed, and the big corporations ought to have realized that fact. No man and no corporation, no matter how wealthy, great or powerful, can, in this day of grace, filch from the Nation any of its natural resources without being made to pay the penalty. Whether it be timber, or grass lands, or water-powers, detection is sure to come, and, following detection, punishment swift and stern. The plea still goes up that to take from such a "developing agent" the resources so pillaged means to retard the "development" of the particular region affected. Well, if that region can only be developed through the agency of theft or grand larceny, then it were better that the region remain undeveloped till the crack of doom.

Conservation of natural resources means the saving from needless waste and destruction of the natural riches which we have, and the exploitation, through proper use and proper development, of all of our resources of land, water, timber, ores, minerals, water-powers, etc. It does not, however, mean their exploitation by improper use or improper development, or improper means, and theft of any of these resources is certainly improper. Likewise, it is expensive and unsafe, nowadays, no matter what it may have been a dozen years ago. A business, no matter what it may be, and no matter who may be the men in control of it, that cannot exist without resorting to theft —to bald-faced pillaging, piracy and robbery—should not be permitted to exist at all. And along this line we reproduce in full an editorial article that appeared in the issue of October 3 of the *Journal of Electricity, Power and Gas*. It is as fair and logical a presentment of the case as we recall having seen in a long while.

> For some time the *Journal* has been giving careful thought to the hydro-electric companies, and to the problems that grow out of their

controversy with the Government. These thoughts have found expression in our editorial columns. The questions involved may jeopardize or affect millions of dollars of invested capital. The investment of further millions in western enterprise may be postponed or abandoned entirely, depending upon the wisdom of the policies outlined. Locked up in the proper solution of the hydro-electric controversy are more matters of vital interest to the West than are involved in any one other problem that confronts us—not excepting irrigation, for it includes irrigation.

Ignore for the moment the invested capital, and the contemplated investments for the future in this line of endeavor. Consideration of this view alone is selfish and personal. It appeals to the intelligence and it appeals to the pocketbook. But these things do not touch the interest of the public man or the private citizen nor does it affect the attitude of the general press or the public officer.

To predicate a request for national legislation upon the desire of some man, or some set of men, to invest large capital in a power or lighting plant is not enough. Our stand must be made on firmer ground; our foundation must be laid broader and deeper than mere personal interest.

The question involved is PUBLIC in its nature. The entire West is affected harmfully or beneficially by its solution. And we must appeal to the people—to the farmer, to the miner, to the vineyardist, to the manufacturer—to the tens of thousands of citizens whom we all know are to be served and are to be benefited by the installing of the vast power plants already under way or in immediate contemplation as soon as this vexed question be settled.

Is not the West interested in having the arid lands made fruitful? Would not the work of the power companies be of untold value to the prosperity of not only sections immediately served by them, but of the whole state itself? Would it not be of immense state value to have lifted to the surface the great streams of water that course their way deep below soil that is parched and dry, but rich, and needing only water to render it a priceless asset to the state?

Is not the owner of that land, who knows that beneath the surface lies the deliverance of his soil, interested and benefited, nay, saved, by the facilities the power companies propose to furnish him in the way of power to raise that water to the surface?

Run over in your minds, you gentlemen of the hydro-electric interests, the long list of industries and the large populations you expect to serve. Catalogue them—no one can do so better than you—and then say whether your undertakings are to be a benefit or a curse to these citizens and to the state. That is the test! Are your great enterprises to benefit any one other than yourselves? If not, then perhaps they are better dismantled, better closed down, better never begun.

You are going to sell the thing you have for sale cheaper or on more advantageous terms than the customer can at present secure an equal services at other hands. You are going to do this, or the oil man, or the coal man, or the other power-providing man is going to keep the business at the old rates.

It is a business proposition. You ARE proposing to do better by your customers than it is possible for them to do to-day. You propose to erect these plants to secure business, to serve the public, to cheapen cost of production, to make it an advantage for a power or light consuming public to purchase your wares. Then you are to be a benefit to them, not a curse.

The *Journal* believes that the material prosperity of the West is to be affected very largely by the success or failure of your enterprises. We know that the fate of millions hangs upon a slender thread. The *Journal*, which is a part of your electrical world, shares all the hopes and fears and all of the suspense that you feel. We therefore feel emboldened to speak our mind.

Court publicity. Deal frankly with the people and take the world into your confidence. Be open, and if this is to be a campaign of education, as it must be to a great extent, let the people and the communities to whom you speak, feel and know that your every promise will be kept to the letter and that you are to benefit and to help them and the state as well as yourselves.

This admonition may not be necessary. The *Journal* does not believe it is; but we do believe it necessary to let the public fully understand that such is your spirit, that such are your intentions, and that the battle we have ahead of us is one in which they, the people, are as vitally interested as you are.

Lest we may be misunderstood, the *Journal* states that it stands pledged to the cause of the National Forest. The wilful, the awful and scarcely conceivable waste that the country has unnecessarily suffered in its natural resources is appalling. The plunderer of forests has mowed down all before him with a wicked wantonness. He has given no thought to to-morrow. To-day has been his fetish.

If the cause of the hydro-electric companies involved even to the smallest extent a fight against the underlying theory of the National Forest movement, or the conservation of our natural resources, we would hesitate before espousing it. The work inaugurated by Gifford Pinchot, and the services rendered by him, are entitled to the highest encomiums at our hands and at the hands of the people, who should be grateful, even though they are not. In this day of abundance and waste we are not likely to appreciate the work of the man to the fullest extent. Future generations surely will.

Doubtless this man is jealous of his cause. It may be difficult to treat with him, difficult to induce him to adjust and dovetail his great work with the demands of a modern, every-day affair. But we must have patience. The cause of the hydro-electric interests rests on a sound foundation. If it does not, then the cause should not succeed. There may be cases where too much is expected, or where too much has been demanded. We know of no such cases. So far as our information goes, the problem to be solved is a simple business proposition. The state, and the people of the state, will be beneficially or harmfully affected by its proper or improper settlement.

True, rich men and wealthy corporations are very largely interested in the immediate question at hand. But the ultimate beneficiaries of their enterprise will be the people. It is not an easy matter to surround the petitions of large corporations with anything like sentimentalism, and sentiment comes pretty near moving the world.

The hydro-electric people appear before the Government, saying:

1. We offer you a means of conserving the coal resources of the country, which are being rapidly exhausted.

2. We offer you a means of conserving the oil deposits of the country.

3. We offer you a means of bringing to the surface the wasted waters that flow under our arid lands, and so save for other uses the water already flowing in our streams.

4. We offer you a means of wresting from the desert, land long regarded as worthless.

5. We offer you a means of cheapening the products of the farm, of lightening the labors of the farmer and the farmer's wife.

6. We offer you a means of conserving and distributing power and light, driving machinery and factories, drawing passengers and freight, and cheapening the products of the land.

7. We offer you roads and highways, and easy means of reaching the great forest reserves where we will operate our plants.

8. We offer you these things without consuming one drop of water, without lessening the resources of the country, but promise you that our work will assist, help and contribute toward the very purpose to which we all stand pledged; namely, the conserving of the natural resources of the Nation.

The matter of adjusting whatever differences that here arise between the Government and the hydro-electric companies are not questions of law; they are business questions, questions of policy, questions that require good, wholesome common sense.

If any one representing the hydro-electric interests, have at any time joined the despoiling lumberman's selfish crusade against forest reservation as a Government policy, they have made a woeful blunder. The hydro-electric enterprises in effect and in spirit are in complete harmony with the movement. They ask nothing that diminishes in the slightest a single natural resource; they offer a means of conserving the very valuable and rapidly disappearing resources of the country to which the policy of the Government stands pledged.

At no point do their interests chafe against the working plan of conservation. There is no friction, and there should be none, anywhere between the Government and the electric people. There will be differences of opinion; a dozen questions may arise that need adjustment; but the individual who, in the cause of the hydro-electric interests, goes into this matter with a club in one hand and a complaint at law in the other is going to lead the hydro-electric interests into a controversy where they do not belong—not for the present, at any rate.

Victories won in the teeth of public opinion are costly affairs at best. The victor reaps a harvest of trouble in the years to come. We have justice and right on our side, and in the end it must prevail. First let us try common sense.

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Interest of Public School Pupils in Forest Conservation

IN ANOTHER part of this issue we print two articles which are rather unusual. The articles appear under the head of "Communications," and were sent to us by members of The American Forestry Association for publication in CONSERVATION. We refer to the two esays, one by Miss Ellen M. Hastings, of the Elk River (Minnesota) High School, and the other by Henry Gregory Allyn, a pupil of the eighth form of one of the Philadelphia schools.

These articles, or essays, rather, indicate in an unmistakable manner the interest that is growing up among American school children in the subject of forestry and its relation to the broader general subject of conservation of the nation's natural resources. The value of the contributions lies not in any new statements, or the expression of any novel opinions, but rather in the fact that both of these papers show that the writers have certainly assimilated the basic facts of the great problem of taking care of the resources we have and of replacing those resources that we have wasted.

The fact has long been recognized that a fertile field of effort lies ready to our hands in the public schools of the

United States. In these schools the nation is raising up the youth that will, in a few years, be the men and women of the country. If these future men and women come to maturity with well-grounded ideas, such as are expressed in the two essays printed in this issue, there is every reason to hope that the cause of conservation will be materially advanced at their hands. It is an omen of promise to note the clear and ready statement of fact contained in these essays; not the parrot-like repetition of statements memorized, but the reduction to a form that is understandable by the juvenile intellect of the matured opinion of high authorities on these weighty subjects. One of these papers comes from the East, the other from the Northwest. We have likewise received essays of the same sort from the Middle West, the South and the West. In every case the essays are the work of boys or girls in the grammar or high schools; and the essays are in each case worthy of publication and would be published were it not for the limitations of space in this magazine. We commend these articles to the careful consideration of our older readers, and, in fact, of every members of The American Forestry Association. Immaturity of expression and lack of style there may be indeed; but these are minor points. The fact remains, amply illustrated by the two essays that appear in this issue, that the boys and girls of our public schools are taking a lively interest in matters pertaining to forestry, and it will be well, indeed, to further this interest by all the encouragement that can possibly be given.

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The Conservation Program in Politics

ONE of the most encouraging features of the political campaign of 1908 has been the unanimity with which the political parties have taken a decided stand in favor of the conservation of natural resources. No matter which Presidential candidate is successful at the polls, the cause of conservation will not suffer. Both the Chicago platform and the Denver declaration of principles declare strongly for a conservation program; Judge Taft and Mr. Bryan are both ardent friends of the conservation movement, and in more than one section of the country Congressional campaigns have been waged principally on the issue of conservation of natural resources.

No matter who the successful candidate shall be, and no matter what may be the political complexion of the next Congress, there will be no backward steps in the movement to take care of the Nation's resources. In the several states, particularly those most affected by any of the different phases of conservation, the movement, it seems certain, will receive a decided impetus during the coming legislative sessions. The leaders, both national and state, of both big parties have recognized the necessity for husbanding the forests, the ores and minerals; for developing a system of waterways; for extending irrigation works, and in general for doing the best we possibly can with the resources that nature has given us.

In this connection, the following quotation from the Democratic state platform of Montana is peculiarly apropos. We quote the fourth, fifth, sixth, and eighth paragraphs of the platform, which paragraphs express in unmistakable language the sentiment of a majority of the people of a great northwestern state:

> It is of paramount importance to protect, develop, and conserve the unparalleled natural resources of Montana under laws most carefully considered and wisely enacted for that purpose, and which will permit a present use sufficient to satisfy reasonable industrial needs and preserve the same as far as may be for future use and development.
>
> Land being the most enduring resource, the permanent prosperity of a people can be best assured by its proper development and conservation; therefore, we recognize in the liberal grant to the state by the Federal Government for educational purposes a solemn trust, to be most carefully and wisely administered and conserved for the purposes for which granted and a great source of wealth, which growth in population will tend largely to increase. This trust should be so administered as to produce at all times the highest possible revenue consistent with a far-sighted conserving policy, and title to such lands as are agri-

cultural should pass to actual settlers in such quantity only as may be necessary to make homes for the settlers.

In order to promote regularity in the flow of streams and the furnishing of a larger volume of water for irrigation and all other useful purposes, the proper and scientific administration of the forests and timber areas, the property of the state, is a policy available forthwith to be initiated and at all times strictly pursued. The enactment of legislation to prevent, as far as may be, forest fires, the stripping of watersheds, and the cutting of unripe timber on lands not profitable for agricultural and horticultural purposes is hereby pledged. Experiments in reforestation should be made, with a view to ascertaining the practicability of affording protection to bare or denuded watersheds.

For the development and prosperity of the present and future industrial enterprises of Montana, the use of water for power purposes is necessary, and every encouragement consistent with a proper safeguarding of the public interests should be given to such use; these safeguards to be furnished by a law permitting the use of water for power generating purposes thereafter initiated, only after a franchise thereof is granted, and under such regulations, restrictions and conditions as, while insuring justice to the investors interested in power development, will relinquish no inherent right of the whole people to whom this and other resources belong.

ANTI-FOREST-FIRE CONGRESS

Twenty-eighth Annual Meeting of the American Forestry Association
Willard Hotel, Washington, D. C., January 13, 14, 1908

A SESSION on Forest Fires, at which the losses of the year will be summarized and means of fire prevention will be discussed.

A session on State Forest Work.

A session devoted to the relations of Forests to Waterways and Soils.

A session devoted to the Appalachian and White Mountain Forest Reserves and the Conservation of Natural Resources.

Each session will be addressed by leading experts from all parts of the country.

A further announcement will appear in the December number.

NEWS AND NOTES

Important Meetings in Washington

AMONG the important meetings to be held in Washington during the month of December are the following: The Southern Commercial Congress on December 7th; The meeting of the Governors and their advisors on December 8th; The meeting of the National Rivers and Harbors Congress on December 9th, 10th, and 11th, and on the same dates the meeting of the Woman's National Rivers and Harbors Congress.

The growth of the Woman's Rivers and Harbors Congress has been little less than phemonenal. Organized on June 29th last, the Congress already has branches in twelve states. Following are the state vice-presidents of this organization: Alabama, Mrs. O. C. Wiley, 141, College St., Troy; Florida, Mrs. T. M. Shackleford, Tallahassee; Hawaii, Mrs. A. F. Knudsen, Kakaha, Kaai, T. H.; Indiana, Mrs. N. L. Agnew, 307 Michigan St., Valparaiso; Iowa, Mrs. J. L. Kennedy, Sioux City; Louisiana, Mrs. W. A. Wilkinson, Coushatta; Massachusetts, Mrs. Emmons Crocker, 48 Mechanic St., Fitchburg; Maryland, Mrs. M. M. North; Missouri Mrs. E. C. Ellis, 2456 Tracy Ave., Kansas City; North Carolina, Mrs. Lindsay Patterson, Winston-Salem; Ohio, Mrs. J. F. Ellison, 2327 Ashland Ave., Cincinnati; Tennessee, Mrs. Benton McMillin, 125 7th Ave., North, Nashville.

The officers of the Woman's National Rivers and Harbors Congress are: President, Mrs. Hoyle Tompkies, 980 Jordan St., Shreveport, La.; Corresponding Secretary, Mrs. Frances Shuttleworth, 621 Cotton St., Shreveport, La.; Vice-president, Mrs. J. Claiborne Foster, Shreveport, La.; Recording Secretary, Mrs. A. B. Avery, Shreveport, La.; Treasurer, Mrs. L. C. Allen, Shreveport, La.; Auditor, Mrs. J. D. Shreveport, La.

Work of The Connecticut Forestry Association

ON SEPTEMBER 21st The Connecticut Forestry Association held a field meeting in the town of Union. About forty members attended, and, considering the inaccessibility of the meeting place, this attendance was considered highly satisfactory. An interesting address was delivered by Mr. Geo. Myers, after which the State Nursery was inspected. In this nursery 350,000 white pines are now being raised. Later in the day the members present tramped over the state forest and examined the plantations of white and Scotch pines which have been made during the past three years. Much interest was expressed, and many announced their intention of planting up some of their own waste lands during the coming year. As a result of the example set by the state, over 250,000 trees have already been planted by private owners in the town of Union.

"A Primer of Conservation"

THE Forest Service has just issued, as circular No. 157, a little booklet that should be in the hands of every member of The American Forestry Association and every friend of the conservation movement in the United States. The title of this pamphlet is, "A Primer of Conservation." It is written by Treadwell Cleveland, Jr., and presents in concise form the case for the conservation of our natural resources. There is not a superfluous paragraph in the pamphlet; from the introduction, the only possible fault of

which might be that it is too well written, to the last page it is clear, concise, and full of interest. The pamphlet contains excerpts from practically all the addresses made at the White House Conference in May, with a history of the origin of the Conservation Commission and the make-up and objects of the Commission. Those desiring a copy of this pamphlet can secure it by addressing the Forest Service, Washington, D. C.

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Irrigation Notes from Washington

SIXTEEN thousand acres of land in Benton County, Washington, southwest of Spokane will come under the canal which the Richland Land Company is building out of Richland. The tract is on the divide between the Columbia and the Yakima rivers, overlooking the first named, and is the last gravity system on the latter stream. The main canal, upon which several hundred men and teams were put to work in the middle of October, is to be fifteen miles in length, and will be completed next February.

The organization back of the project is the result of the merging of the Lower Yakima Irrigation Company and the Benton Water Company, the latter having a canal which supplies 4,000 acres in the vicinity of Richland. Those interested in the new company are: Howard Amon, formerly president of the Benton Water Company; Lee A. Amsbury and Samuel T. Laird, formerly of Garfield, Wash.; Rufus Fullerton, formerly of Palouse, Wash., and Messrs. Allen, Downs and Struve, of Seattle. Headquarters has been established at Richland.

Practically the entire Yakima River is diverted at the intake of the canal, part of the water going into the Northern Pacific Irrigation Company's canal and the remainder into the canal now under construction. The Lower Yakima Irrigation Company has the oldest rights on the river, having consolidated with the Yakima Irrigation and Improvement Company's rights, also the old Rich rights.

Engineers measured the stream during the irrigation season last summer, and at all times there was at least 1,000 gallons of water going through the gates, unused, every second This insures an abundance of water for the project. The North Coast Railway Company has construction crews between Richland and Kennewick, and the Kennewick Northern is hastening men and material into the field, which will give Richland two railroads.

Leon Lake Irrigation Company has been organized in Spokane, with a capital of $100,000, to irrigate 2,000 acres of land between Deer and Leon lakes, in Stevens County, Washington, north of Spokane. The incorporators are M. R. Mann, B. H. Becker, and E. Morgan. Water will be taken from Deer Lake and led through a canal one and a quarter miles to the edge of the land. The canal will be six feet wide at the bottom, and four feet deep. It will cost $25,000 to construct it and complete the laterals, which will tap every acre of land.

Deer Lake contains 1,600 square acres, and has a watershed of 700 square miles, hence the supply of water is sufficient for far more than the 2,500 acres to be reclaimed. Most of the land is level and is wooded. Work on the irrigation system and on clearing the land is now under way, and will be completed in time for crops next spring. The land will be devoted to apple-trees and berries. No provision has been made by the company for a domestic supply, but water is reached at a depth of from fifty to 100 feet all over the new tract.

M. H. Allen, treasurer of Sumpter, Oreg., south of Spokane, has petitioned that city for a right of way for a water ditch through the town. His object is the reclamation of a vast tract of land contiguous to Sumpter and beyond. Much of this land was formerly held by the Sumpter Townsite Company, which platted many acres, with the idea that at no far future date the city would absorb it for town lots. This dream has been dispelled and the town-

site company has given Mr. Allen an option on all its holdings. The ditch will not only supply water for this land, but many acres of other farming ground will be brought to a state of cultivation. The scheme is looked upon as one of the most important that has taken root in Baker County for some time. Under cultivation the land will guarantee an income of $45 an acre yearly from its hay product alone. It is now a waste.

Spokane capitalists are planning to put in a big irrigation plant on the Columbia River, above the Cascade locks, southwest of Spokane, where a vast tract of land has been secured, and more land is under option. Cassius Wright, a rancher on the Big Klickitat River, reports that the syndicate is buying farming lands up the river sixteen miles from Lyle, Wash., with a view of making a canal into Lyle, where the fall will be 400 feet. Electric power may be generated for manufacturing purposes. The suitable fruit lands along the river will be subdivided into tracts and sold to truck and fruit growers, with water privileges.

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A Pioneer in National Irrigation and Forestry

TIME is the real test of wisdom. However wise a man may seem to-day, events of future years may prove him to have been a simpleton; and ideas that to-day appear Utopian may, after many to-morrows, command the respect and admiration of the multitude.

Occasionally a man has arisen whose ideas and work have gained their greatest appreciation long after his death. Such a man was John Wesley Powell, formerly Director of the United States Geological Survey. The far-reaching foresight of this man is becoming more manifest with the passage of years. Every feature of his plans for the organization and conduct of the Geological Survey shows that he had vividly in mind all the importance of the larger movements that only to-day are being agitated—movements for the conservation of the National resources.

Major Powell foresaw the time when accurate information would be needed concerning the mineral products of the public domain. He realized that at some time in the future forestry would be a great issue. He saw the potential value of the reclaimed arid West and foretold the era of National reclamation. To be ready for this he measured the streams from which the water must be derived for irrigation and hastened the topographic mapping of the areas involved.

Many other projects of National importance were foreseen and prepared by Powell, the last that has been forcibly brought to notice being the project for national drainage. During the recent public agitation of this matter, when broad and exact data were desired, the needed facts were found ready in the records and publications of the bureau that he had created. Probably few of the persons making those early investigations realized half the meaning of the results for the future, but Powell fully understood their importance.

At the time Powell resigned the Directorship of the Geological Survey one of his more intimate younger associates asked him what work that he had done would, in his own judgment, be most likely to keep his name in the memory of men. He replied at once, "My trip down the Grand Canyon." The reply was modest, for the trip down the Grand Canyon was only a season of daring exploration and wild venture. Powell's more enduring memory is involved with the work of building up a great National Bureau, with the larger problems he foresaw, and with the larger solutions for which he made preparation. When the truly great Americans are more wisely judged in a day of better judgment it may be that this wise counsellor for the determination and conservation of the Nation's resources will stand high among the prophets and patriots of the National pantheon.